

MUNICIPAL JOURNAL AND ENGINEER

VOLUME XXII.

NEW YORK, APRIL 3, 1907.

No. 14

Published every Wednesday by
THE MUNICIPAL PUBLISHING COMPANY
Flatiron Building, Madison Square
New York City
Telephone, 6723 Gramercy, New York

A. PRESCOTT FOLWELL, EDITOR

TERMS OF SUBSCRIPTION, PAYABLE IN ADVANCE

United States and possessions, Canada, Mexico, Cuba, \$3.00 per year
All other countries 4.00 per year

Make all checks payable to The Municipal Publishing Company.

Entered as second-class matter, January 3, 1906, at the Post Office
at New York, N. Y., under the Act of Congress of March 3, 1879.

Readers are invited to contribute to the MUNICIPAL JOURNAL
AND ENGINEER, either in the form of special articles or of letters
discussing matters of current interest.

It is also desired that the facilities furnished by the reference
library in this office should be widely known and freely used by
those interested in municipal affairs. Visitors will be welcomed
and provided with conveniences for search, and inquiries by mail
will be promptly dealt with.

CONTENTS

| | |
|---|-----|
| Small Cities and City Beautiful..... | 329 |
| Recent Reports on City Plans (Illustrated). | |
| By Charles Mulford Robinson..... | 330 |
| Sewage Testing Apparatus (Illustrated)..... | 334 |
| Street Tree Inventory (Illustrated). By George A. Parker..... | 335 |
| Tree Culture in New York..... | 337 |
| The Disposal of Municipal Waste (Illustrated). | |
| By W. F. Morse..... | 339 |
| News of the Municipalities..... | 343 |
| Mayors' Recommendations..... | 347 |
| REVIEW OF THE PERIODICALS | |
| Danger in Boiled Water..... | 349 |
| German Municipal Slaughter Houses..... | 349 |
| Municipal Ownership of Street Railways..... | 349 |
| Municipal Trading in Glasgow..... | 349 |
| Advice Concerning Municipal Ownership..... | 350 |
| Taxing the Unearned Increment..... | 350 |
| Safety Device on Street Cars..... | 350 |
| The Municipal Index..... | 351 |
| Book Reviews..... | 355 |
| News of the Societies..... | 356 |
| THE WEEK'S CONTRACT NEWS..... | 357 |
| Legal News—A Summary and Notes of Recent Decisions..... | 364 |
| Trade Notes..... | 365 |
| Personals..... | 365 |

Small Cities and the City Beautiful

THE article entitled "Recent Reports on City Plans," which appears on another page, can, in our limited space, do but scant justice to these admirable reports, as the illustrations inadequately suggest the beautiful plates which accompanied them. These reports are not confined to glowing generalities concerning what a beautiful place each of the several cities might be made, but suggest definite improvements. Much of the effort is toward beauty, but utility is by no means overlooked, as in the bridge approaches for Brooklyn and the freight yards for St. Louis.

But while these magnificent reports, which deal with the expenditure of millions in our largest cities, are of general interest, it is to be hoped that their very magnificence will not so overwhelm the smaller cities as to discourage efforts on their part toward results which must necessarily be more modest. Rather should such smaller cities learn from these reports that the future expenditure of millions may be avoided by the present wise investment of hundreds. Much of the expense involved in the plans referred to is for the acquiring of exceedingly valuable real estate for the widening or creation of thoroughfares, and for parks and parkways—areas the desirability of most of which for these purposes might have been foreseen and provided for by a plan prepared years ago, and which could then have been obtained at a fraction of their present cost. The earlier a city plan can be prepared and the more comprehensive it is made the greater the advantage to a city, providing it is acted upon promptly. It costs little if any more to provide a wide street in a newly opened property than a narrow one; and if the roadway be made no wider than present needs require the cost of construction will be no greater, while the additional width at the side permits of parking, and tree-planting, which may be left to the initiative of the property owner, or may be made compulsory on the same principle that paving sidewalks is now required—a plan embodied in a bill now before the Pennsylvania Legislature.

General principles for such city planning were excellently stated by Baumeister (see MUNICIPAL JOURNAL AND ENGINEER for March 6). To secure the desired efficiency and economy the best talent obtainable should be employed, for the plan once adopted can be changed only with difficulty and often at great expense.

In connection with the cost of such improvements as parks, we would call attention to the article on "Taxing the Unearned Increment" on page 350, in which it is stated that in certain German cities the real estate tax rate increases as the value of the land increases, the city collecting from 3 to as high as 25 per cent. of the increase in values. The New York report recommends that the city, before making an improvement, purchase the adjoining land and by selling later realize for itself the increase in value created by the improvement. This would require enormous initial expenditure. The German method secures to the city but a small part of this increase, but the city incurs no risk and is at no initial expense, except that of the improvement itself, and benefits by the appreciation in all property affected and not by that alone which it purchases. This method seems worth considering.

RECENT REPORTS ON CITY PLANS

Outlines of Proposed Improvements in St. Paul, St Louis, Boston and New York—Parks, Parkways, Wider Thoroughfares, Bridge Approaches, Civic Centers and Other Recommendations

By CHARLES MULFORD ROBINSON

"SOME of us thought we had got hold of an original idea, in planning for the future development of the city," said a speaker at the dinner in Toronto a few months ago when the City Plan Report was made public. "But we soon found," he added, "that the Continent was possessed by it." And the Capitol Approaches Commission of St. Paul, whose beautiful Report has lately come from the press, after outlining what other cities are doing in planning for the future, declares: "It is a movement which is as much in the air to-day as the movement for parks was in the air ten or fifteen years ago. The park system is now recognized as a necessity. The interior boulevard, the Mall, and the grouping of public buildings will also be a recognized necessity a dozen years hence." An interesting evidence of the truth of these statements is afforded by the City Plan reports which appeared independently, but almost simultaneously, in February, from St. Paul, St. Louis, Boston, and New York. All were profusely illustrated and very handsomely issued, at an expense that bore witness to confidence of conviction, and to the courage of a strong faith.

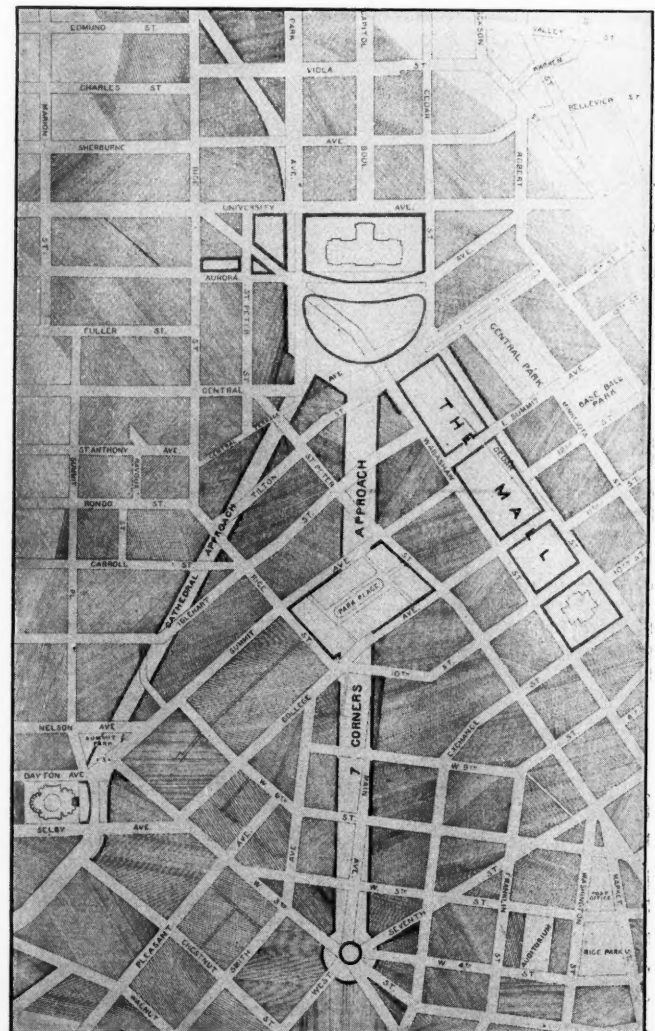
ST. PAUL.

The report from St. Paul, made by the Capitol Approaches Commission, has for its purpose the presentation of a plan for bringing intimately into the structure of the city the site of the beautiful, new capitol. This noble building is perched on an eminence which ought to give to it conspicuousness; but the site is irregular and circumscribed, the surroundings exceedingly dreary and commonplace, and as it happens not a single street directly approaches sides or front. A demand, created significantly by popular appreciation of the structure's beauty, that there be correction of these conditions, resulted in the appointment of the Commission, pursuant to a resolution of the common Council approved February 9, 1906. The commission brings forward a very stunning plan, declares that "all that is necessary at present is the acquisition of the land, and that the development can be carried out gradually as the means of the city will permit," and recommends "that the city of St. Paul should bear the heavier part of the burden, the entire actual cost of the land."

The estimated cost of acquiring the approaches and rounding out the site is carefully made by the commission and comes to just under two million dollars. The financial plan is not definitely stated in the report, but it would seem to contemplate an issue of bonds by the city, the State paying interest and sinking fund charges. This will mean, the commission says, "the addition of less than one-tenth of a mill to the State tax levy the first year, on the basis of the present valuation, and an average of only

one-thirtieth of a mill for the whole period during which the proposed bonds would run." There is made further along a careful calculation as to the effect of the improvement on property abutting on the approaches, and it is figured out that the yield from the added assessable values due to the improvement would certainly equal the amount to be collected for the bonds upon the aggregate assessed valuation. Thus, it is claimed, the improvement will pay for itself. In support of this contention, the commission notes the experience of Cleveland, Brookline, Chicago, San Francisco, New York, Brooklyn, Baltimore, and Buffalo.

The diagram fairly outlines the plan: The Mall would extend from the new capitol to the old. It would be about 1,500 feet long—1,800 feet to the façade of the new capitol—and 300 feet wide, exclusive of the street. The



PROPOSED CAPITOL APPROACHES, ST. PAUL.
THE TERRITORY INSIDE THE HEAVY LINES IS TO BE ACQUIRED FOR
APPROACHES AND PARKWAYS.

Central approach, on the north and south axis of the building, would extend 3,800 feet, to the Seven Corners, an important corner to which seven streets converge. It would be an avenue 180 feet wide, passing midway through Park place. The Summit avenue approach is designed to connect the new cathedral with the capitol. It would be 100 feet wide and 3,200 feet long, would be a valuable park connection, and—as would be the Central approach—an exceeding convenience to every-day traffic, aside from its æsthetic advantages. Of the æsthetic advantages of the whole scheme the mere diagram gives evidence.

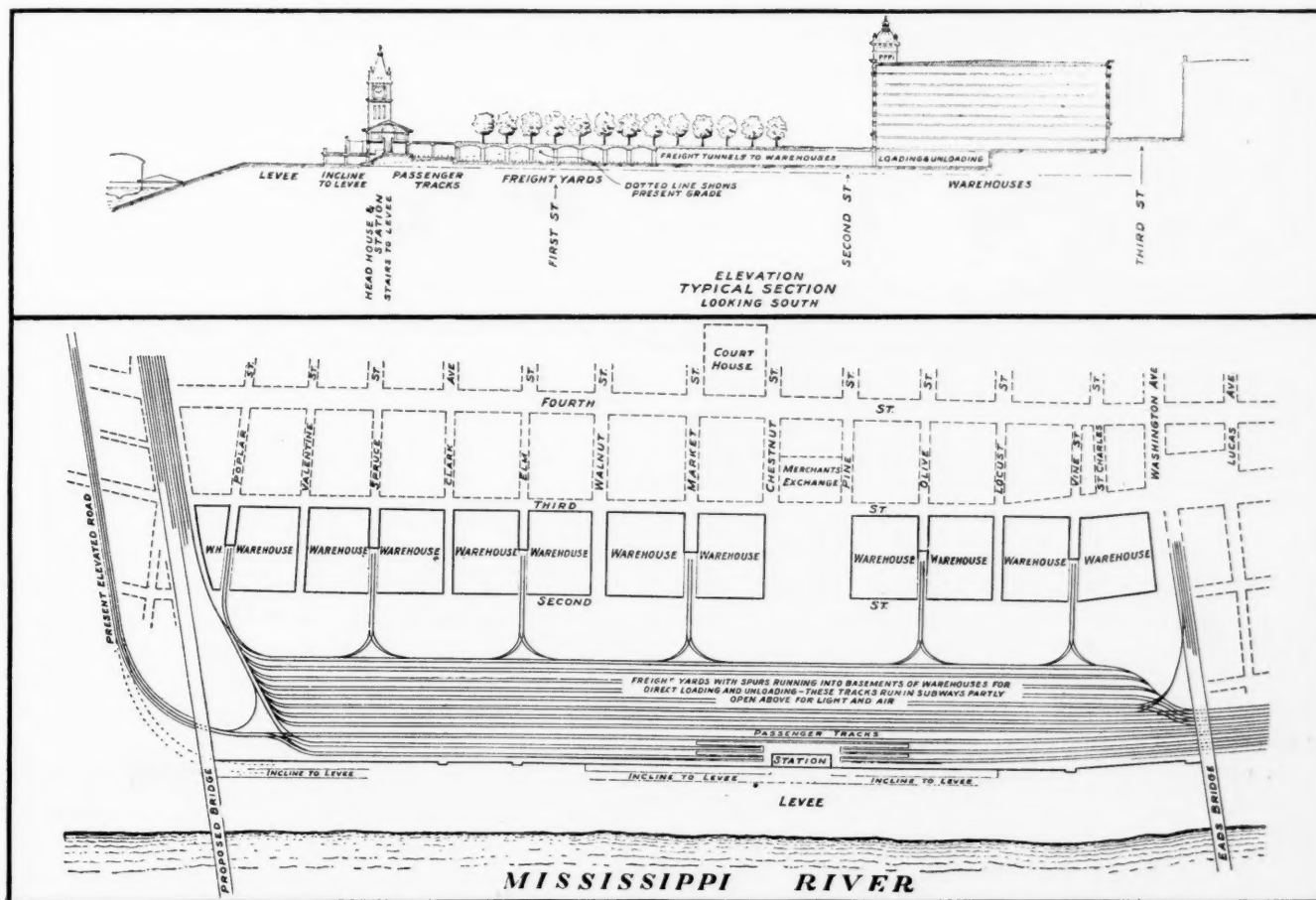
St. Louis

The St. Louis Report makes a volume of more than 100 pages. It is a compilation of the reports of the several committees appointed by the Executive Board of the Civic League to draft a city plan. In its preparation more than forty citizens, representative of almost every profession and interest, took part. The report is divided into a number of chapters, of which those bearing directly on the city plan consider: "A Public Buildings Group," "Smaller Buildings Groups," "An Inner and Outer Park System," and "Street Improvements." Then follow a couple of chapters advocating a municipal art commission and outlining the legislation necessary to carry into effect the suggested improvements.

As to the Public Buildings Group, there is re-presented, with hearty endorsement, the group plan brought out by the Public Buildings Commission three years ago. The

Smaller Buildings Group is a general term to describe a plan for a series of neighborhood centers. Here, gathered around the playground or other open space, would be the public school, the branch library, the city bath, the model tenement, the church, the social settlement, the fire-engine house—those public, semi-public, or private institutions, in short, that stand for the mental, moral, or physical improvement of the neighborhood in which they are. A carefully worked out system of these has been planned, covering, with its definitely chosen sites, the most needy parts of the congested district. Yet the committee's recommendations do not transcend, for park reservations for this purpose, the \$670,000 which is included therefor in the recent \$11,200,000 bond issue. It is this bond issue, in fact, which gives special timeliness to the City Plan Report of St. Louis, although as a whole the report looks much further into the future, contemplating a total expenditure, spread over many years, of more than \$25,000,000.

The proposed scheme of inner and outer parks and boulevards is a local application of the plan made familiar by the aspirations of Chicago, Providence, and other cities. In mere parks St. Louis is already well off, taking high rank for relative acreage; but for connecting parkways, large plans are now presented. The Kingshighway, nineteen miles long, and stretching from river to river and connecting the principal parks, is included, in this plan, in the "inner" system. The money for it has been appropriated, some of it is built, and detail plans are completed. An-



PROPOSED RIVER FRONT IMPROVEMENT, ST. LOUIS. TRACKS AND FREIGHT TUNNELS UNDER PROPOSED ESPLANADE.

other great boulevard is to follow, it is proposed, the Des Peres river and go to Jefferson Barracks. Altogether the parkways and drives of the inner system, if entirely carried out, would reach a total of thirty-five miles. The outer system, extending far into the country and suburbs, is still more elaborate; but that, as the committee frankly says, is a matter for the future's accomplishment.

Under the head of "Street Improvements" there is much of interest to municipal officials. The streets, says the report, "are more than merely cleared spaces for travel. They are the homes for most of our inhabitants for twelve to sixteen hours each day. They are the features of the city which are best known to visitors and travelers, and upon which are based their impression of the desirability of the city for a place of residence." The committees recommend no changes in the width or direction of the established streets in the section east of Twelfth street, because of the prohibitive cost of such alterations. They do suggest, however, that Locust street, from Broadway west to Thirteenth, be freed from car tracks and incorporated in the boulevard system; and that Twelfth street be widened where necessary to give it a breadth uniform with its widest part. It should then be "freed from car tracks and ornamented with trees, fountains, and statuary." A further proposal is that Chestnut street be widened to 150 feet from the Union Station to the proposed municipal group, that it be developed like the Champs Elysees, and that the city buy two blocks for a small park, thus making the entrance to St. Louis exceedingly attractive. A number of streets are named upon which it is recommended, for convenience as much as for æsthetic effect, that traffic be restricted to light vehicles and that they be given a treatment in accord with such use.

The beautifying of triangles at street intersections, the narrowing of the roadway in purely residential streets to a width of twenty-four or twenty-six feet, the systematic planting of trees, the removal of wires and poles, and the adoption of a conduit system—either by the city or by a private company carefully regulated by the city; the improvement in design of such overhead construction as is necessary; the rearrangement of car lines by a commission to be appointed to study the traffic problem; the control by the city of new street platting—on authority yet to be asserted; and the establishment of a building line, are other points touched upon in this part of the report. A number of pages and several inserted maps and drawings are also devoted here to the improvement of the river front. For this an elaborate plan is worked out. It contemplates the purchase by the city of the land lying between the Eads bridge and the proposed bridge at Poplar street, from the Levee back to Second street; the excavation of the bluffs on this property to a level with the Levee; the construction of railroad tracks at this lower level, and of an esplanade above them, at the Second street level. At the river-front side, this esplanade would have much the effect of the one at Algiers, and its level would be similarly reached. The railroad freight tracks would have convenient connection with the basements of

the warehouses, which would rise along Second street, and the outer tracks could be devoted to suburban passenger traffic. For the convenience of this there would be occasional stations on the esplanade.

The recommendations contained in the chapter discussing legislation necessary to make the report's conclusions effective, include the authorization of a municipal park commission, of a municipal art commission, of a "public reservation district"—similar to the "Metropolitan Park district" about Boston—with a separate commission; the extension of the city's power of condemnation, and the advocacy of the principle of giving to a city the right to take land for the purpose of reselling it, in order thus to recoup the expense of large improvements.

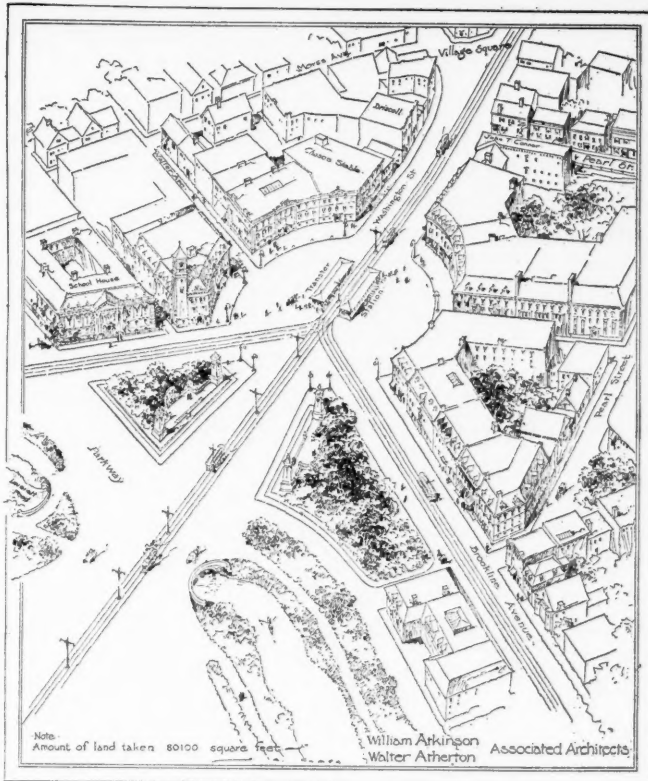
BOSTON

In the publication of the Report of the Boston Society of Architects, on the improvement of that city, seven organizations join. Among them are the Chamber of Commerce and the Stock Exchange. Yet the report is put forward in a tentative way, simply as a study designed to create enough interest to invite a more authoritative investigation. Therefore, it is not nearly so interesting to readers of this journal as are the preceding dead-in-earnest reports. But it does contain much that is suggestive.

The theory is put forward that the city of Boston, as distinguished from the metropolitan district, is not developing as rapidly as it should, because of the great areas of unoccupied space (land and water) which lie in the very heart of the city, dividing it into distinct sections; and because of too restrictive building laws. The blighting spaces include the Boston and Albany car yard on Boylston street, the South Bay, the land formerly occupied by the Boston and Providence Railroad, the Fens, and the Charles river. The overcoming of these conditions thus receives special attention.

It is proposed that an investigation be made "as to the feasibility of an exchange by which the South Bay would be filled and utilized by the Boston and Albany Railroad as a car yard, thus freeing the Boylston street land for building purposes." Plans are presented for extending several streets across the Fens and through the lands of the Old Boston and Providence road, and three plans are brought forward for building a large island in the Charles river. By one of these plans the island would be developed as a park, by another it would be the site of monumental buildings, by a third it would be an additional residential district. Other plans include an inner and outer boulevard, connecting the suburbs, an improvement of Copley Square (which is now being carried out), a glorification of Arlington street, that it may make a worthier terminal for Commonwealth avenue, may be the site of public buildings, and have direct connection with the river drive, and finally there is long discussion of elaborate plans for improving the port.

In connection with the outer boulevard is given a proposed detail at a suburban station which is thought worthy of reproduction, because most of these reports deal with



TROLLEY INTERSECTION AND STATION AT BROOKLINE, MASS.

urban areas only. To assist in the general suggestiveness of this report, illustrations, with brief comments, are presented of special features of Budapest, London, Rio Janeiro, Washington, Cleveland, St. Louis, Buffalo, New York, Hamburg, Rome, and Antwerp.

NEW YORK

The New York City Improvement Commission, appointed in 1903, stated in their preliminary report in 1905, and repeat in their report of this year for further emphasis, that "A comprehensive plan for the city's development must necessarily anticipate the future growth of the city for many years to come," and be as far as possible all-comprehensive and consistent. "Such a plan necessarily involves not only the laying out of parks, streets and highways, the location of city buildings, improvement of water fronts, etc., but also questions of more or less detail relating to pavements, sidewalks, appropriate house numbers, gas and electric fixtures, manner of indicating the streets, location of statues and monuments commemorating historic events, tree planting, and a countless number of other matters, all important and essential if New York is to take its place as one of the great metropolitan cities of the world." The commission in this report has confined itself to formulating a comprehensive general outline for future development, so far as the general plan is concerned, setting forth the essential features; not attempting, for instance, to exactly locate the small parks which will be desirable.

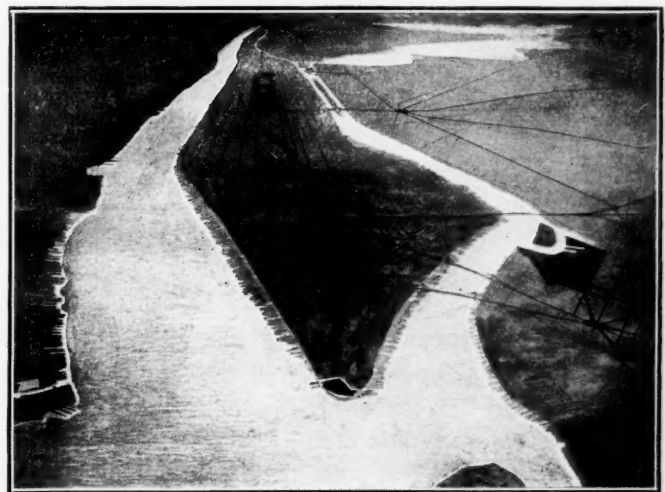
The report is divided into two general heads: 1. A plan for thoroughfare, large parks and connecting parkways; 2. Solutions of detail problems requiring early treatment. The salient feature of the general plan is the affording of avenues of connection between the different



PROPOSED SUBWAY AT FIFTH AVENUE AND FORTY-SECOND STREET, NEW YORK, LOOKING EAST TOWARD FIFTH AVENUE.

parts of each borough, as well as between the different boroughs, and also the outlying districts; also, besides securing to each borough a park system of its own, connecting the parks of the different boroughs with each other by suitable parkways to form an harmonious whole, each supplementing the other. These include substantially complete parkway connections between Central Park, the parks on the Hudson River, in the Bronx, and, by way of Randall's Island or Blackwell's Island bridges, the park systems of Queens and Brooklyn, extending to the ocean front; the whole presenting a park system unrivaled in extent and variety. They believe parkways and narrow parks radiating into adjacent territory are of special value in making the whole accessible and inviting to all citizens.

They recommend general plans for piers and docks, a marginal street around Manhattan, water-front parks, and the abolishment of all grade crossings. Also widening Fifth avenue by moving the stoop areas which owners have for years been permitted to utilize for private purposes. At Fifth avenue and Forty-second street there is now great congestion of traffic, and the commission proposes relieving this by a subway in Forty-second street



BIRD'S-EYE VIEW OF NEW YORK, LOOKING NORTH SHOWS GREAT ARTERIES OF TRAFFIC BETWEEN MANHATTAN AND ADJOINING BOROUGHES.

forty feet wide, and using the present sidewalk space as a surface roadway, the sidewalk to be carried behind the building line in arcades under the first stories of the buildings.

An approach from Central Park to Blackwell's Island bridge 160 feet wide is recommended, divided into several special roadways. The most insistent need of Brooklyn is access to Manhattan, and a series of thoroughfares leading to and connecting all the bridges is proposed, as shown in the illustration. For Queens, Olmsted Brothers were employed to plan a comprehensive park system, including sea-shore parks, inland parks and parkways. The Bronx is already better equipped with avenues and parks than any other borough. Richmond (Staten Island) cannot be connected with the other boroughs by parkways. For this is recommended a seaside park fronting the lower bay.

With reference to public buildings, they recommend making a civic center for the entire city at the present City Hall Park, Manhattan; also a civic center of public buildings in each of the other boroughs. Uniform house numbers, news stands, sign boards, etc., all to be regulated by the city, are considered desirable. Brief treatment is also given of the subjects of statues, bridle paths, street paving, tree planting and cab service. The commission strongly recommends the acquisition by the city of property adjacent to these improvements, that it may benefit by the appreciation in land values; referring to several instances in which cities have in this way entirely recouped the cost of improvements. If this had been done at the widening of Livingston street, Brooklyn, the entire cost of this would already have been recovered by the appreciation of value of adjoining property, as shown by recent sales.

The united testimony of all these reports is that American cities are astir with big ambitions, that their development in the coming years is to be on more scientific and æsthetic lines. There is no willingness supinely to accept the dictum that increased population means increased congestion and discomfort. Rather, there is a determination that, from the larger opportunity it gives, there shall come enhanced facilities, greater convenience, and municipal beauty and dignity. Of the American city we may yet be proud.

SEWAGE TESTING APPARATUS

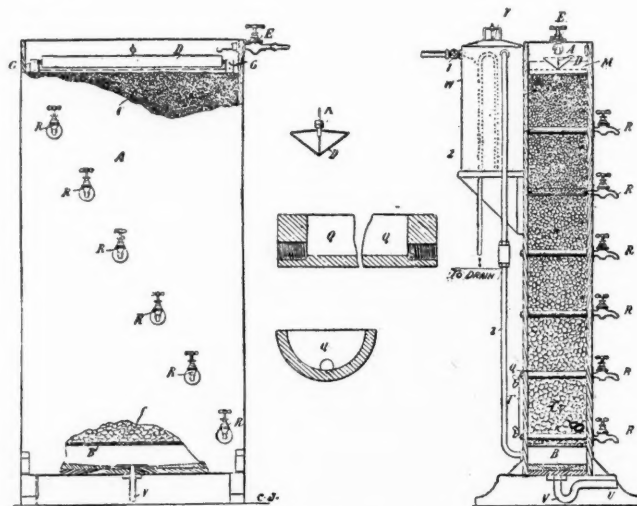
Contrivance for Determining Desirable Depth, Rate of Flow, Rest Period and Other Details of Filters
—Data Obtained by Its Use

MR. SCOTT-MONCRIEFF, in a paper read before the Sanitary Institute (England), March 1, described an apparatus used by him for testing sewage treatment methods which presents many interesting features. The apparatus consists of a box 8 feet high by 3 feet wide and 1 foot broad, and it is filled to a depth of exactly 6 feet with hard clean coke gauged to pass a 3-4-inch mesh and to be

rejected by a 1-4-inch mesh. Semi-circular troughs with a transverse section of some 1 1-2 inches are placed across the breadth of the apparatus and connect with taps on the outside of the casing. The first of these troughs and taps is situated exactly one foot from the surface of the coke, each of the remaining five being fixed exactly a foot deeper than the trough above it, and the sixth tap comes right at the bottom of the filtering material. It will, therefore, be seen that samples of the effluent can be obtained after it has passed down through 1 foot, 2 feet, 3 feet, 4 feet, 5 feet, and 6 feet, respectively, of filter-bed. It is, of course, necessary to provide some means by which the sewage can be delivered in suitable doses and at proper intervals over the surface of the coke.

The sprinkling is brought about by means of a tipping trough of aluminum, which extends the full length of the apparatus, and which discharges into a perforated tray made of the same metal and of the same area as the top surface of the coke. The liquid is delivered from the tipping trough in such a manner that it flows regularly over the whole of the tray, and gives a very fairly equal distribution of sewage over the surface of the coke. Taps are provided, so that the rate of flow into the tipping trough may be regulated, and the trough, which is divided longitudinally into two compartments by a division piece, has on this division piece, and placed in the center of it, an upright peg onto which can be threaded weights. By means of these weights the amount of liquid which will tip the trough can be adjusted to a nicety. It will, therefore, be seen that there is ample means for regulating the flow of the sewage.

The superficial area of the coke is three square feet, which is claimed to be amply sufficient for accurate observations, and any rate of flow can be arranged for. Supposing, for instance, three pints were allowed to be discharged by the tipper every 7 1-2 minutes. This would mean 24 pints, or 3 gallons, per hour for 3 square feet, or 1 gallon for each square foot. One gallon per square foot per hour equals 24 by 4,840 by 9 gallons per acre in 24 hours, which is just over 1,000,000 gallons per acre—such an amount as has produced satisfactory results in practice.



SCOTT-MONCRIEFF SEWAGE TESTING APPARATUS

BOROUGH OF KEIGHLEY

TABULAR LISTS OF ANALYST'S REPORTS ON EXPERIMENTS WITH THE "SCOTT-MONCRIEFF" SEWAGE TESTING APPARATUS

W. H. Hopkinson, A.M.Inst.C.E., *Surveyor*.F. W. Richardson, F.I.C., *Analyst*

| Date 1905 | Number of Sample | Where Taken From | Total Solids | Oxygen absorbed in Four Hours at 80 deg. Fah. | Nitrites as Ammonia | Nitrates as Ammonia | Free and Saline Ammonia | Albuminoid Ammonia | Per Cent. Purification on Oxygen absorbed | Per Cent. Purification on Albuminoid Ammonia | Average Purification | Remarks Material, Gasworks Coke, gauged 1½ in. to ¾ in. | Number of Sample |
|-----------|------------------|-----------------------------------|--------------|---|---------------------|---------------------|-------------------------|--------------------|---|--|----------------------|--|------------------|
| July 28 | 15 | Tank effluent..... | 40.0 | 2.610 | Nil..... | Nil | 1.80 | 0.848 | ..... | ..... | ..... | Pumping from 140 ft. of tank. Air cistern not working since July 14th. Rate of flow, 1,000,000 gallons per acre per day. | 15 |
| | 16 | Filter effluent from 4-ft. tap... | 48.0 | 0.515 | Nil..... | 0.702 | 0.340 | 0.248 | ..... | ..... | ..... |  | 16 |
| | 17 | " " " 5-ft. tap... | 48.0 | 0.343 | Nil..... | 0.874 | 0.240 | 0.248 | ..... | ..... | ..... |  | 17 |
| | 18 | " " " 6-ft. tap... | 52.0 | 0.303 | Nil..... | 0.810 | 0.540 | 0.268 | ..... | ..... | ..... |  | 18 |
| Aug. 11 | 19 | Untreated sewage..... | 76.0 | 4.215 | Nil..... | Nil | 3.25 | 0.912 | ..... | ..... | ..... | Pumping from 140 ft. of tank. Air supply, 33 gals. of air to 1 gal. of sewage since July 28th. Rate of flow, 1,000,000 gallons per acre per day. | 19 |
| | 20 | Tank effluent..... | 74.0 | 3.905 | Nil..... | Nil | 3.10 | 0.650 | 7.35 | 28.73 | 18.04 | | 20 |
| | 21 | Filter effluent from 4-ft. tap... | 70.0 | 0.966 | Nil..... | 0.493 | 0.45 | 0.217 | 77.08 | 76.21 | 76.64 | | 21 |
| | 22 | " " " 5-ft. tap... | 66.0 | 0.328 | Nil..... | 0.493 | 0.340 | 0.212 | 92.22 | 76.75 | 84.58 | | 22 |
| Aug. 25 | 23 | " " " 6-ft. tap... | 54.0 | Nil | Nil..... | 0.466 | 0.370 | 0.224 | 100.00 | 75.44 | 87.72 | Pumping from 175 ft. of tank. Air cistern not working since Aug. 11th. Rate of flow, 1,000,000 gallons per acre per day. | 23 |
| | 25 | Untreated sewage..... | 136.0 | 7.818 | Nil..... | Nil | 5.100 | 1.072 | ..... | ..... | ..... |  | 25 |
| | 26 | Tank effluent..... | 74.0 | 3.310 | Nil..... | Nil | 2.732 | 0.532 | 57.67 | 50.37 | 54.0 | | 26 |
| | 27 | Filter effluent from 4-ft. tap... | 62.0 | 0.283 | Trace..... | 0.922 | 0.400 | 0.248 | 96.40 | 76.86 | 86.13 | | 27 |
| Sep. 15 | 28 | " " " 5-ft. tap... | 58.0 | 0.318 | ..... | 0.967 | 0.220 | 0.138 | 95.94 | 87.14 | 91.54 | Pumping from 210 ft. of tank. Air cistern not working since Sept. 8th. Rate of flow, 1,000,000 gallons per acre per day. | 28 |
| | 29 | " " " 6-ft. tap... | 52.0 | 0.283 | Mere trace. | 1.176 | 0.240 | 0.198 | 96.94 | 81.53 | 88.96 | | 29 |
| | 37 | Untreated sewage..... | 80.0 | 6.676 | Nil..... | Nil | 4.00 | 0.780 | ..... | ..... | ..... |  | 37 |
| | 38 | Tank effluent..... | 52.0 | 3.307 | Nil..... | Nil | 2.40 | 0.448 | 50.46 | 42.56 | 46.51 | | 38 |
| Sep. 22 | 39 | Filter effluent from 4-ft. tap... | 74.0 | 0.602 | Trace..... | 1.320 | 0.26 | 0.228 | 89.63 | 70.77 | 80.20 | Pumping from 210 ft. of tank. Air cistern not working. Rate of flow, 1,500,000 gallons per acre per day. | 39 |
| | 40 | " " " 5-ft. tap... | 58.0 | 0.560 | Slight trace | 1.010 | 1.52 | 0.228 | 91.47 | 70.77 | 81.12 | | 40 |
| | 41 | " " " 6-ft. tap... | 60.8 | 0.401 | Nil..... | 0.954 | 0.80 | 0.228 | 93.99 | 70.77 | 82.38 | | 41 |
| | 43 | Untreated sewage..... | 78.0 | 5.288 | Nil..... | Nil | 3.95 | 0.948 | ..... | ..... | ..... |  | 43 |
| 44 | 44 | Tank effluent..... | 58.0 | 2.898 | Nil..... | Nil | 2.00 | 0.408 | 45.2 | 57.0 | 51.1 | Pumping from 210 ft. of tank. Air cistern not working. Rate of flow, 1,500,000 gallons per acre per day. | 44 |
| | 45 | Filter effluent from 2-ft. tap... | 80.0 | 0.982 | Nil..... | Trace..... | 1.50 | 0.328 | 81.4 | 65.4 | 73.4 | | 45 |
| | 46 | " " " 4-ft. tap... | 78.0 | 0.457 | Slight trace | 0.928 | 1.10 | 0.368 | 91.3 | 61.2 | 76.25 | | 46 |
| | 47 | " " " 5-ft. tap... | 90.0 | 0.525 | Trace..... | 1.038 | 0.82 | 0.268 | 90.0 | 71.7 | 80.85 | | 47 |
| | 48 | " " " 6-ft. tap... | 76.0 | 0.525 | Nil..... | 0.617 | 1.40 | 0.248 | 90.0 | 73.8 | 81.9 | | 48 |

The apparatus is capable of determining (a) the depth of filter required to produce the necessary standard of purity in the effluent; (b) the quantity of air necessary for the life processes of the organisms; (c) the proper rate of flow per unit of filter-bed surface in order to obtain the best results; and (d) the best period of rest between each discharge.

The depth of filter, the rate of flow, and the period of rest best suited to any particular sewage is determined by analysis. There remains the question of the amount of air necessary. The method employed is to have a cistern which can be filled with water, and which forms part of the apparatus, resting on brackets at its side. A siphon arrangement can empty this cistern as soon as it is full, and it can be filled at any desired rate. The tank is closed save for a vent pipe to atmosphere, which is provided with a valve so that air cannot enter by it, but only be expelled, and save also for another pipe which communicates with the bottom portion of the filter-bed, which finishes in an air-tight space beneath the grating, or false bottom, which supports the coke, provided with a non-return siphon tap for the discharge of the filtered sewage. The result, then, of the water and air tank being emptied, is that air is actually drawn downwards through the filtering material, and by noting the rate of flow of air which gives the best results with the least depth of filter, the best aeration for the filtering material may be ascertained.

STREET TREE INVENTORY

Method of Assigning Values to Trees—Example Offered by
Hartford Inventory—Care Needed by Trees
—Ratio of Trees to Population

By GEO. A. PARKER, Supt. of Parks, Hartford, Conn.

HURD, in his "Principles of City Land Values," asserts as a fundamental principle that real estate in cities has no value *per se*, all values being based upon its relation to the people, which in case of private ownership can be expressed by a ratio as so much per front foot for each 1,000 population. To illustrate: Land, without the buildings, is worth in the women's retail district \$10 per front foot per each 1,000 population, and \$2 per front foot in the highest-priced residential districts for the same number.

Believing this principle could be applied to public grounds, and also expressed by a ratio, I attempted an inventory of the park areas of Hartford, trying to express in dollars and cents their scenic and recreative values, without regard to what they would bring if sold to private parties for building or other purposes, the latter being the usual basis of valuation. In doing so it was necessary to fix a money standard for the value of specimen trees in the parks. After much thought and many trials, I finally decided upon, for trees of the better species, sound and well located, \$75 per square foot of cross area of their trunks, four feet above ground.

In discussing this subject with the Superintendent of Streets and members of the Street Board, it seemed to them desirable that a similar inventory should be taken of the street trees of Hartford, and Mr. Alexander Cumming, the then Forester of the city parks, was engaged to do this work. About three-fourths of the territory has been covered. Something like 7,400 trees have been listed, giving a valuation of about \$450,000.

From expressions of residents—which, however, are comparatively few—that have reached me, I conclude that the trees in front of their places are worth to them all or more than this ratio gives, and the residents of any particular street, so far as I can learn, feel that the value given to the trees of their street is a conservative one, rather under than above their real value. The valuation of the street trees of Hartford will exceed one-half million dollars; not really an asset of the city, if by asset is meant what city property would bring at private sale, but yet a most valuable addition to the city, which the people would not willingly part with, because it is a real and substantial addition of a simple and most pleasing type of beauty, and "beauty," to quote Mr. H. A. Caparn, "is one of the most useful and practical things in the world, because it makes the other things worth while." This half a million's worth of public property it wants not only to keep intact but to increase; an amount large enough to warrant the employment of a skilled man to care for, and to appropriate a reasonable amount to maintain. It is fully five years since the present agitation for the care of our street trees began in our city government, but this inven-

tory seems to have crystallized the efforts of the past. For an ordinance was passed in March creating the office of a City Forester and a way to provide means for the work.

The method of taking the inventory is very simple. Schedule blanks in blocks of one hundred each, with stiff backs, are used. Two men work to advantage; one keeps the record and the other measures the trunks, tells the name, condition of trunk, and top, location, whether troubled with insect or fungi, or needing pruning for dead or live wood, and locates each tree on the city map by number. Usually the two men do about two hundred trees as a day's work. After the field notes are taken the cross area is reckoned from the diameter. The valuation is obtained by multiplying the area by the valuation of the species, condition and location of trees, and these are added together, each being marked on a scale of 25. If all conditions are satisfactory, then when added it gives a multiple of 75, the number of dollars each square foot of area is assumed to be worth.

From these schedules readable reports are made up from time to time for the newspapers. Those which have been printed are too long for the present article. I, therefore, make extracts from one on Washington street.

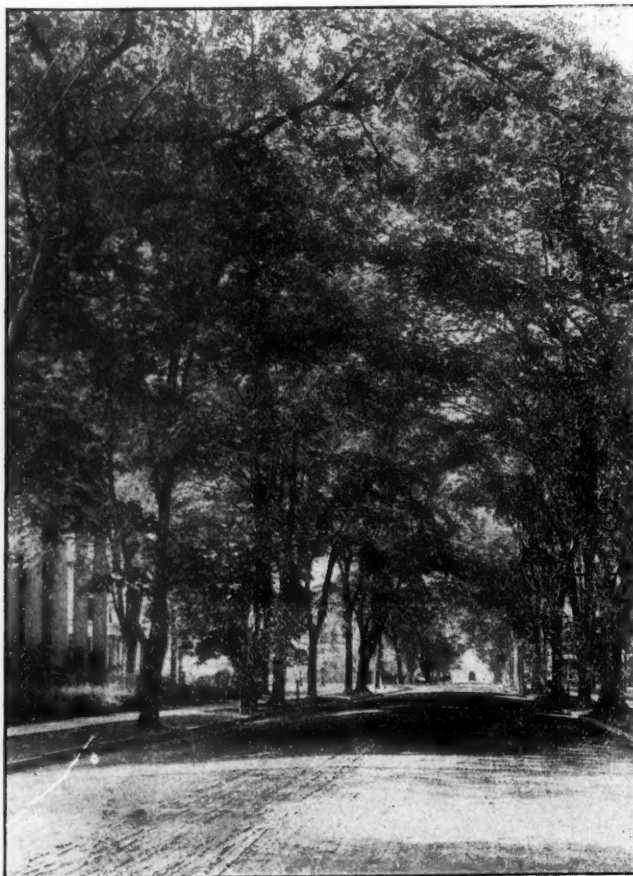
There are 271 trees on Washington street, 249 next to the curb and 22 near property lines. They include 12 species, as follows:

| | Schedule Rate. |
|-------------------------|-------------------|
| 114 Sugar Maple..... | 23 |
| 94 American Elm..... | 25 |
| 16 American Ash..... | 23 |
| 10 Red Maple..... | 18 |
| 10 American Linden..... | 20 |
| 8 Silver Maple..... | 20 |
| 8 Norway Maple..... | 23 |
| 5 Horse Chestnut..... | 20 |
| 2 Tulip..... | 20 |
| 2 American Beech..... | 25 |
| 1 Sycamore Maple..... | 20 |
| 1 Buttonwood..... | 17 |

The largest tree is near the corner of Jefferson street, an elm, 5 1-2 feet in diameter with a spread of branches fully 90 feet, the growth of the last century and a quarter, for during the severe winter of 1777 its branches were cut off for fuel.

The trees of this street are unusually large for Hartford, 5 being over 3 feet in diameter, 69 between 2 and 3 feet, 142 between 1 and 2 feet, and only 55 being under 1 foot. That is, out of 271 trees, 216 are over 1 foot in diameter. Of the 94 elms more than half are over 2 feet in diameter and all but one over 1 foot. Of the other trees over 2 feet in diameter, there are 6 rock maples, 4 silver maples, 2 red maples, 7 American ash, 4 American linden, 1 each of the American beech, buttonwood and tulip.

On the basis on which the valuation of trees in this inventory has been reckoned, the trees of Washington street are worth \$37,500.81. I have taken the trouble to see a number of the residents of the street to get their opinion of such a valuation. Not one but thought the valuation low and would consider it a small compensation for their destruction, and, were there no trees there, would be willing to pay their proportionate part to have such trees established if it could be done at once.



WASHINGTON STREET, HARTFORD, CONN., SUMMER OF 1906.

INVENTORY OF TREES, HARTFORD, CONN., OCT. 26, 1906

Street, Washington.

Side, Both.

Between Capitol Ave. and New Britain Ave.

| Area | Multiple | Value | No. | Name of Tree | Species Value | Near Curb | D's-tance | Diam-eter | Con-dition Lo-cation | Con-dition of Trunk | Con-dition of Top | Spray-ing In-sects | Spray-ing Fungi | Prun-ing Dead Wood | Prun-ing Live Wood | Re-move | REMARKS |
|------|----------|--------|-----|------------------|---------------|-----------|-----------|-----------|----------------------|---------------------|-------------------|--------------------|-----------------|--------------------|--------------------|---------|-------------------------------------|
| 3.14 | 73 | 229.36 | 527 | Sugar Maple.... | 23 | C. | 20 | 2.0 | 25 | 25 | 25 | No | No | Yes | No | No | Poor trunk and top. Remove. |
| 2.84 | 75 | 212.63 | 528 | American Elm.... | 25 | C. | 30 | 1.9 | 25 | 25 | 25 | Yes | No | Yes | No | No | |
| 1.33 | ... | ... | 529 | American Elm.... | 25 | C. | 30 | 1.3 | 25 | 25 | 25 | ... | ... | ... | ... | ... | Recently planted. Cut back and tar. |
| 1.13 | 67 | 8.38 | 530 | Silver Maple.... | 17 | C. | 25 | 0.4 | 25 | 25 | 25 | No | No | No | No | No | |
| ... | ... | ... | 531 | Sugar Maple.... | 23 | C. | 30 | 0.2 | 25 | 25 | 25 | No | No | No | No | No | Should be replaced. |
| 3.14 | 72 | 226.22 | 532 | American Elm.... | 25 | C. | 25 | 1.8 | 25 | 25 | 20 | Yes | No | Yes | No | No | |
| 3.14 | 75 | 235.70 | 533 | American Elm.... | 25 | C. | 25 | 2.0 | 25 | 25 | 25 | Yes | No | Yes | No | No | Remove large protuberance |
| 2.84 | 75 | 212.53 | 534 | American Elm.... | 25 | C. | 18 | 1.9 | 25 | 25 | 25 | Yes | No | Yes | No | No | |
| ... | ... | ... | 535 | Norway Maple.... | 23 | C. | 30 | 0.3 | 25 | 15 | 10 | No | No | Yes | Yes | No | Clean out knot-holes. Cement. |
| 2.55 | 72 | 183.24 | 536 | American Elm.... | 25 | C. | 18 | 1.8 | 25 | 25 | 20 | Yes | No | Yes | No | No | |
| 3.14 | 67 | 210.51 | 537 | American Linden | 20 | C. | 30 | 2.0 | 25 | 20 | 20 | No | No | Yes | No | No | Fine specimen. |
| 2.27 | 75 | 170.17 | 538 | American Elm.... | 25 | C. | 35 | 1.7 | 25 | 25 | 25 | Yes | No | Yes | No | No | |
| 7.07 | 67 | 473.56 | 539 | Silver Maple.... | 17 | C. | 45 | 3.0 | 25 | 25 | 25 | No | No | Yes | No | No | Struck by lightning. Cement. |
| 4.52 | 75 | 339.30 | 540 | American Elm.... | 25 | C. | 24 | 2.4 | 25 | 25 | 25 | Yes | No | Yes | No | No | |
| 3.14 | 75 | 235.70 | 541 | American Elm.... | 25 | C. | 30 | 2.0 | 25 | 25 | 25 | Yes | No | Yes | No | No | |
| 9.08 | 67 | 608.20 | 542 | Silver Maple.... | 17 | C. | 40 | 3.4 | 25 | 25 | 25 | No | No | Yes | No | No | |
| 4.52 | 75 | 339.30 | 543 | American Elm.... | 25 | C. | 40 | 2.4 | 25 | 25 | 25 | Yes | No | Yes | No | No | |
| 7.07 | 75 | 530.10 | 544 | American Elm.... | 25 | C. | 30 | 3.0 | 25 | 25 | 25 | Yes | No | Yes | No | No | |
| 2.84 | 75 | 212.63 | 545 | American Elm.... | 25 | C. | 32 | 1.9 | 25 | 25 | 25 | Yes | No | Yes | No | No | |
| 4.91 | 62 | 305.35 | 546 | American Elm.... | 25 | C. | 22 | 2.5 | 25 | 10 | 15 | Yes | No | Yes | No | No | |

SCHEDULE BLANK FILLED OUT FOR WASHINGTON STREET, HARTFORD, CONN.

A sample inventory blank, filled out for Washington street, is presented. Mr. Parker will gladly furnish copies of these to city officials until his supply is exhausted.

NEEDS OF THE TREES

Concerning the Washington street trees the following report was made:

First.—Nearly all the elms show more or less injury from the elm leaf beetle, and if the beetles are not destroyed this coming season the trouble will be quite serious. If neglected a few years more most of the elms will be dead.

Second.—Ninety-two out of 114 maples are affected with the cottony maple scale. Here, again, spraying is the remedy.

Third.—Two hundred out of the 271 trees on the street need pruning for dead wood. Some have a good deal of work in this line to be done, but most of them comparatively little. When this work is once thoroughly accomplished it requires but little annual care. But they should receive attention every year, for, while trees rightly cared for require but little annual care, yet they require this continually, like every other living thing. Living things, when they exist under conditions where nature has located them, take care of themselves, but no living thing placed under such artificial conditions as trees in city streets can do so.

I have said nothing about the ratio of street trees to population because I know nothing about it. Hartford has about one tree to ten persons; Springfield, Mass., one tree to five persons; Paris, France, one tree to forty persons. It would not surprise me if Springfield, Mass., had the largest number of street trees to population of any city of more than 50,000 population in the country. For conditions are favorable there for their growth, since they have a most efficient forester and the people appreciate them.

As to the cost of maintaining street trees, I imagine it will not be over two per cent. of their valuation as reckoned, nor under one per cent.; but this is all guess work. I have no data upon which to base an estimate.

TREE CULTURE IN NEW YORK

RECOGNITION of the value of trees in city streets has led to the development of tree culture by the New York Park Department along two lines that are practically new. Although, at various times in the past, the Park Department has planted trees in the streets to the number of something like 4,000, there has not been hitherto any provision for the regular conduct of this work. Recent statutes, however, have given the Park Commissioners authority to order trees to be set out along any designated street, and to assess half of the cost of the tree planting to the abutting property owners and to pay the balance by the issue of bonds—the procedure being similar to that employed in carrying out paving operation and street improvements generally. The other new development is brought about by the specific appropriation of sums of money for the maintenance of trees on the streets of the Boroughs. In a desultory sort of a way some work of this sort has been done before. Last year the sum of \$5,000 was appropriated for "forestry." The sums now appropriated—\$20,000 to \$30,000 in some of the Boroughs—are sufficient to make the novelty of the work apparent in the improved conditions of the streets.

Already in the Bronx Borough, work of setting out new trees is going on. The kinds of trees likely to be chosen for this sort of work, as given by Samuel Parsons, Superintendent of Parks, are: American and English lindens, American and English elms, American ash, Norway maple, and the pine tree. No poplar or silver maples will be set out, as the wood is not strong and the trees do not keep their shape well. The trees will be planted at distances of from 40 to 45 feet and will be placed in excavations refilled with about 14 cubic yards of top soil. This top soil, by the way, is a difficult material to find of good quality, and the method now adopted is to inspect the soil at the point of shipment. Rather elaborate provisions will be made for watering these trees. A porous tile laid in a broken-stone drain will run the length of the tree hole at the bottom of the excavation. At one end a 4-inch drain tile will come to the surface and

will be covered with a cap. In dry weather, water is to be poured down the drain. Trees of 3 or 4 inches in diameter and from 14 to 16 feet in height will be specified. Presumably the age of such trees will be about 8 or 10 years. Around each tree substantial guards, of neat appearance, will be placed, for which about \$7 or \$8 each will be paid. Standard specifications for tree planting have not been finally decided upon, one unsettled question being that of the guarantee. If the contractor is required to guarantee the trees for a year, he is put to some expense for care and watering which really the skilled men of the Park Department are more competent to do. Mr. Parsons estimates that strict inspection would keep the loss of trees below 10 per cent. The loss of trees during the first year and later might be a serious matter, and it is to avoid this loss that high standards of material and workmanship will be required. Trees planted and protected as described are likely to cost \$60 apiece. In carrying out this work it is the intention to set out only one species of tree on a street, and where possible to similarly treat a long stretch of many blocks.

The new appropriation for maintenance of trees outside of the Park will be used simply for the extension of the system already in use in the Park. This will consist of the usual pruning, the care of wounds and the protection against fungous and insect pests.

The work of protecting the trees against pests throughout the Boroughs may be illustrated by the work carried on by the "Tree Doctor," Mr. E. D. Southwick, from his headquarters in Central Park, the Entomological Experimental Station. The station consists of about one-quarter of an acre of ground, with flower beds, a little greenhouse, an office and a shop. Here the choicest flowers are grown for food for the 2,000 species of insects, which at one time or another have been discovered in the Park and placed under observation. Their life history and habits are studied here, as well as the action of poisons most suited to bringing those lives to a happy end. The first campaign in the spring directed from the headquarters is that against the tussock moths. Wire brooms made in half-round shape, are used for scrubbing the cocoons and egg masses off the trees, after which they are gathered up and destroyed. Leaves bud out on the trees at a certain temperature and exactly the same temperature is required to hatch the tussock moths. As soon as leaves appear on the trees, then the spraying with the poisonous solutions begins. Altogether, twenty-six different solutions are in use, the principal ones of which are arsenate of lead, London purple and Paris green. The favorite preparation for a tussock moth is as follows: London purple, 1 lb.; lime, 8 lbs.; flour, 8 qts.; water, 100 gals. Fungous growths are generally treated with Bordeaux mixture, a compound of sulphate of copper and lime. Every second year it is customary to treat the trees with a mixture of a fungicide and an insecticide. Common insect pests in Central Park, beside the tussock moth, are the aphids, scale insects, wood borers, leaf miners and bark borers. Among the worst species of the groups are the elm beetles, the elm borers, the San

Jose scale, elm scale, the oyster-shell bark louse and the scurfy bark louse. The presence of so many insect pests in the Park, 2,000 identified species, is attributed largely to the large number of plants that are received from points all over the world. Some of these importations behave worse apparently than in their native land; the elm borer, for instance, a native of Germany, has been found on 100 different species of trees. The most effective treatment for the borer is to pour carbon disulphide into the hole and stop it up with putty or soap. The fumes of this volatile liquid penetrate the remotest crevices and are fatal to animal life.

The only mechanical device used in connection with the entomological work, is the spraying machine and its accompanying apparatus. A 1½-horsepower Daimler gasoline engine supplies power to a Gould three-piston pump which maintains a constant pressure of 60 pounds per square inch. This apparatus is mounted on a platform and carried about on a truck. The liquid is conveyed through a quarter-inch cloth-insertion hose, specially made to stand the pressure and to be light in weight. An extension pole, devised by Mr. Southwick, is capable of elevating the spraying nozzle, so that trees 45 feet high can be sprayed. From 600 to 1,000 gallons a day may be handled with this machine, and with the aid of six men, from 100 to 200 trees can be sprayed. If big elm trees are being treated, however, the spraying of four or five is a good day's work.

Besides the long list of insect pests that destroy the trees are the fungous growths. At the present time a new pest of this class is causing considerable anxiety, particularly in the Bronx Borough. This fungus has already caused the death of many chestnut trees and is threatening the life of many more; in fact, if some remedy is not found, it seems likely that it may exterminate all the chestnut trees in the vicinity. The usual treatment—Bordeaux mixture—has been only partially successful. The life history of the new fungus has been studied by Dr. Murill, mycologist and first assistant in the New York Botanical Garden. Last fall pure cultures were made from the infected chestnut trees, transferred to sterilized twigs, and this spring fungi from these twigs were found to transmit infection to healthy trees. Hence, the isolation and identity of the fungus was proved. Further study indicated that healthy trees became inoculated through wounds. The fungus feeds on the cambium and adjacent living layers of the trees. Its presence is first shown by the death of the cortex, and the change of its color to a brown much of the shade of dead leaf. Later, wart-like excrescences appear as the fruiting pustules push their way to the surface. From these yellowish-brown pustules, spores emerge in ribbon-like reddish-brown masses, which are blown about by the wind or carried by insects, birds and squirrels. In this way the contagion is spread to another tree, where it enters the cambium layer through a wound. Spraying with copper sulphite solution, cutting out infected limbs and measures for increasing the vitality and resisting power of the trees are the only means for fighting the disease so far discovered.

THE DISPOSAL OF MUNICIPAL WASTE

Systems and Methods, with Special Reference to American Conditions—Types of Furnaces and a Proposed Classification of the Same—Descriptions and Illustrations

By W. F. MORSE, Sanitary Engineer

This Series of articles, begun in the February, 1906, number, will be continued until completed and will be illustrated by original drawings, cuts, diagrams and pictures, and contain many tables valuable for reference.

The Subjects Already Treated by the Author Are:—

1. The Waste Collection Service in American Towns; Methods and Results.
2. Definition of Terms; Quantities; Proportions; Character of Waste in General.
3. Garbage; Analysis; Proportions; Values.
4. Dry Refuse and Rubbish; Quantities and Treatment.
5. Classification—Commercial Values after Recovery.
6. The Refuse Utilization Stations in New York, Boston, Buffalo, and Brooklyn (illustrated).
7. Municipal Ashes; Analysis; Proportions; Values when Separated.
8. Ashes from Cremation of Garbage; Analysis and Values; Comparative Table.
9. Comparison of Ashes from English and American Cities; Cremation Means.
10. The Utilization of Municipal Waste in General; English and American Methods.
11. Commercial Values of Refuse and Ashes when Marketed and Manufactured.
12. The Analysis of Garbage; Tankage, Its Value (Special Tables).
13. The Garbage Disposal Plant, Cleveland, Ohio.
14. Street Sweepings; Fertilizing Value and Treatment.
15. Comparative Commercial Values of Waste.
16. Foreign Destructors; Special Chapter by an Eminent Authority.
17. The first Garbage Cremators.
18. Official Reports on Cremators.
19. Chronological List of American Crematories from 1885.
20. List of Government and Institutional Installations.
21. Consolidated Tables of Installations; Hygiene and Sanitation.
22. Types of Furnaces; the Operating American Furnaces (fully illustrated). Continued.

The Following Are to Appear:—

23. Calorific Value of Waste as Fuel (comparative table).
24. Reduction and Extraction Process Described and Illustrated; the Earlier and Later Methods.
25. American Methods; Col. Waring and His Successors.
26. Present Situation in This Country; Résumé.
27. Means for Improvement as Suggested by Several Investigators.
28. What May Be Expected of the Future.

The Need for a Better Classification of Garbage Furnaces

THERE is evident need of a better classification of the terms at present used for the description of the several classes of American garbage furnaces. Since there is no distinction made in the words cremator, crematory, garbage furnace, incinerator, or destructor, when used in connection with phrases defining cremation of waste or refuse, there is a confusion and uncertainty as to what kind or class of furnace is intended to be meant, when these terms are used.

The titles *garbage furnace* and *night soil furnace* were used by Rider and Mann in the two first installations. The word *cremator* was adopted by the Eagle Sanitary and Cremation Company and described all their municipal furnaces. They applied the term *fire-closet* to the small installations for domestic and schoolhouse purposes.

Crematory was the term employed by the Dixon Sanitary Crematory Company and it is still a part of their official title.

When the Montreal installation was made by Mr. Chas. Thackeray, he used the "Thackeray patent incineration and cremation systems" and called his refuse furnace an *incinerator*. This was a misnomer, as the furnace, copied from the "Fryer," was properly a destructor.

The Davis Company called their furnace a *garbage*

furnace, and their apparatus for burning bodies a *cremation furnace*.

Mr. I. Smead, of Toledo, in building closets for the disposal of night soil in school buildings, called them *dry closets*, but his large furnace for municipal work was a *garbage crematory*.

Col. Waring, when building his furnace for dry refuse at East Sixteenth street, New York, called it an *incinerator*, and this title has been followed by Mr. H. De B. Parsons, who calls his two New York installations for dry refuse *rubbish incinerators*.

The writer, when installing the Boston plant for dry refuse, chose the term *destructor*, mainly for the purpose of a distinctive name not previously used in this country. This was continued in the title of the Morse-Boulger Destructor Company. This is a furnace that burns garbage and refuse, not ashes, and the word destructor has not the broad application as employed in British practice.

One American author* writing on this subject has made a classification which does not appear to give much help. He divides the crematories into five groups: (1) Those where the garbage is burned by direct heat without previous drying; (2) where it is partially dried before burning; (3) where it is burned on a hearth or grate by fires from other grates; (4) where it is extensively dried, then stoked to another grate to be burned, and (5) where gases from one grate or cell are passed through others to dry the garbage thereon.

He further proposes a sub-division of these groups with respect to the garbage grates: (1) Solid grates of iron; (2) grates of fire clay; (3) grates of hollow iron cooled by water; (4) grates of hollow cast iron cooled by air.

This classification is not exact in terms, altogether too confusing and unwieldy for reference, and conveys but little idea of the constructions of our crematories. His list of patents cited illustrates the difficulties of these divisions, as many furnaces are built under two or more of these groups, and some are altogether outside this list.

The classification of this apparatus by the U. S. Patent Office was at first made under the title "furnace for cremating garbage." Afterwards "garbage crematory" was used, and infrequently "furnace for incineration of garbage or night soil." The present custom is to include everything under the title "furnace," with a sub-division, "garbage furnaces" or "crematories," and "incinerators" for the destruction of other substances.

The popular use of all the foregoing terms is combined in the term "garbage crematory," but this does not appear

*Garbage Crematories in America. Capt. W. M. Venable. Jno. Wiley & Son, N. Y.

to be sufficiently distinctive for the three separate types or forms now employed, since it is applied to furnaces quite unlike in construction and for different uses.

Since the purposes, the construction, and the limitations of the various apparatus are now much better defined than formerly, and since there is a need for a better distinctive classification, it seems only wise to separate them by using such terms as will distinctively indicate the particular uses for which they are built.

Proposed Classification

Thus, a *crematory* would mean a furnace for burning garbage and refuse mixed or not separated, but not ashes; an *incinerator* would mean a furnace for refuse or rubbish only, and a *destructor* would imply the destruction of all classes of waste together in an unsorted condition, following the British term and practice. If this nomenclature were adopted, it would simplify and make the whole subject clearer to those whose knowledge is, as yet, somewhat limited.

There would undoubtedly be opposition from some builders who now use and claim one or another of these terms as their own title and property, but no valid objection can be made on this score, as each builder now constructs furnaces of different plans, for quite different uses, under the same patents, and may, with advantage to themselves as well as to the public, adopt a distinctive title for each, prefixing their own or the company's name to the furnace.

The Operating Crematories

In attempting to describe the cremating furnaces now mostly in use the writer has found it difficult to get accurate descriptions, except from the patent drawings, and as each builder departs somewhat from his original plans according to local conditions, these drawings do not precisely represent the furnaces.

The intention is to give such descriptions—not in technical terms—and illustrations as will enable the reader who may be interested in the subject, to understand something of the construction and operation of the various forms.

As far as possible the builder's own terms and description are followed, and there is added some slight sketches of those who have longest been identified with this work.

The Inventions of Mr. Andrew Engle

This inventor was one of the first whose devices for sanitary work came prominently before the public. As early as 1884 he took out a patent for an apparatus that "conveyed solid and fluid matter through tubes to a retort in a furnace, subjected this to heat, and conveyed the volatile matter into a superheater, converting it into inflammable gas, at the same time converting the solids remaining in the retort into charcoal."

This and another invention were purchased by a company formed for the purpose, and were extensively exploited. Subsequently, Messrs. Engle and Thompson secured a new patent (508,511, 1893) and under the title of the Engle Crematory Company, built furnaces at Van-

couver, Winnipeg and Topeka, and Mr. Thompson built one at Wichita, Kan. None of these are now operating. Mr. Engle's latest invention is "Engle's Fuel and Fertilizer," "a combination of garbage, night soil and manure with a material that renders it valuable for the purposes of fuel or fertilizer. The product may be made in bricks with a press and stored for use, or it may be used while green for making fires in kilns, steam plants, or crematories. The fertilizer is equal to bone meal."

The inventor further says: "I seek to devise means by which the wastes may be kept from the streams at a financial compensation to the town so doing. While I recognize I cannot hope to do it all, I feel ambitious to give to the world results that will save life and aid the world in better health and consequently greater happiness."

Mr. Engle has for more than twenty-five years been identified with sanitary work in many lines, and is a student and analyst of very considerable attainments. The Engle fire closet and Engle cremator have made his name known all over this country.

The Engle Sanitary and Cremation Company was formed at Des Moines, Ia., early in 1886 to take over the patents of Mr. Andrew Engle.

The officers were: J. C. Savery, president; Jas. Callanan, treasurer; G. H. Warner, secretary. The Western business manager was W. C. Smith. The Eastern business was done from a New York office of which W. F. Morse was manager and Benj. Boulger constructor. This was the first company to systematically push its business, and during the sixteen years of its work built many cremators in this country. The most successful installation was at the World's Fair, Chicago, in 1893. It was the first company to build abroad; its Panama furnace (1892) is still in active use. During the panic of 1893 the officers of the company suffered financial reverses and few constructions were made thereafter. The two last ones at Grand Rapids and Milwaukee were not under the Engle patents, though under their name.

The success of this company and the development of this idea of destroying worthless matter by fire in this country was largely due to the unfailing financial support of Mr. James C. Savery, the president of the Engle company. He took the keenest interest in the work and was a firm believer in the benefits to be had from improved sanitary conditions brought about largely by these cremators.

Mr. Savery died in 1905 and his place in the business

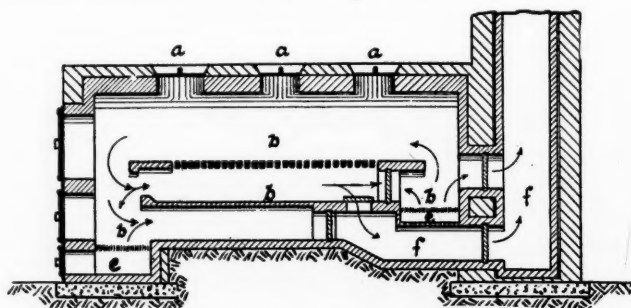


FIG. 38. LONGITUDINAL SECTION ENGLE CREMATOR (1887)

of the company and in the progressive spirit of this line of sanitary work has never been filled.

The early form of the Engle cremator was a rectangular brick construction whose exterior dimensions in height and width were each about one-third of its length. There was usually a steel chimney of 75 feet and a wooden covering house with inclined wooden approaches and wide platform for wagons.

The interior was lined with fire brick and divided by a horizontal set of grates, made at first of hollow iron pipes, and below these a fire-clay platform of tiling.

The garbage was discharged direct from the carts through three circular openings to the upper or first set of grate bars, the liquid not held in suspension in the garbage passing through to the platform where it was evaporated. At the rear end of the cremator was the first or primary fire-box, separated from the chimney by a damper. The secondary fire was at the front end and below the level of the drying platform. Dampers controlled the volume of gases in such a manner that the heat from the primary fire passed over the garbage piled on the upper grates, and under these over the platform, or under the platform, as desired, or direct to the chimney as determined by the damper between them.

The theory of this furnace—which is indeed the theory of its successors and imitators—was that the gases and vapors of the combustion of the waste piled up on the grates should be compelled to pass over the secondary fire before being released to the stack. By arrangement of the dampers the second fire may become the primary fire, and the first one in turn consume the gases.

One of the openings for charging in the top was large enough to admit the carcass of a horse. The evaporating hearth received all moisture and also the ashes from the grates above; but with this exception, no attempt was made to dry out the moisture before burning. The operation was without nuisance when properly conducted, and the cremator used any available fuel, gas, coal, wood or coke. Very large quantities of night soil and saturated garbage were destroyed when required, with reasonable expense for fuel and labor.

The points of weakness in this form were the grates of iron piping, the damper of cast iron, and the tiling of the evaporating hearth, which gave way under high temperatures when saturated with moisture. A new

form of stronger construction was finally adopted and became the standard.

In this furnace the same general exterior dimensions and appearance are kept, but the interior is greatly modified. There are two fires placed on horizontal lines at opposite ends of the grate, which is made of a series of railroad bars, spaced and inverted and held in this position by clips. The lower hearth is omitted, the liquids passing into the bottom compartment, being helped in evaporation by the hot ashes from the grates above. The dampers are fire-clay slabs and the interior walls of heavy blocks of fire clay. Subsequently the iron rails of the garbage grates were replaced by a special fire-clay grate, and this by a series of flat fire-brick transverse arches which are still used.

In all furnaces of this type the garbage grates are difficult to maintain. Those of hollow pipe, even when brought through the furnace walls to the outside to obtain a circulation of cold air, speedily gave way. Afterwards these grates were connected to headers and a circulation of water kept up, but the loss of heat and incomplete combustion of garbage in contact made it necessary to discard this system. The steel railroad bars are probably the best for iron grates and give better service than any form of triangular hollow cast-iron bars, or of water grates where the heat taken up by the water is a very large item of loss.

There are still some ten or twelve of the Engle cremators operating. The largest in continuous service and the oldest installations in this line in this country are at New York, Panama, Richmond and Norfolk, Va.

Considerable space has been given to the work of the Engle company, since it was the first in general disposal work and the general features of its construction were followed by those who came after, with such modifications as were patentable.

Garbage Furnaces of W. F. Morse and Benj. Boulger

Some time after the Engle Company had suspended business, W. F. Morse and Benj. Boulger, who had been connected with this company, obtained a contract for a crematory at San Salvador, Central America. All the material needed was sent from New York, and Mr. Boulger installed the furnace in 1895-6 under the patent obtained by him in 1893.

In 1898-9 Mr. Morse designed and constructed the Refuse Utilization Station at Boston, and here for the first time was built that form of furnace that afterwards came to be known as the Morse-Boulger Destructor.

In this Boston furnace the original horizontal garbage grates of the early Engle pattern were used, but the front end of the upper tier was inclined sharply down to the fire box. These grates were parallel arches of fire-clay brick with spaces for passage of ashes.

The secondary fire was in the lower flue, over which all products of primary combustion passed, the light particles and fine dust being detained by perforated vertical walls. There is also a 60-h.p. vertical boiler on the top of the rear end, operated by the furnace heat, but having its own fire

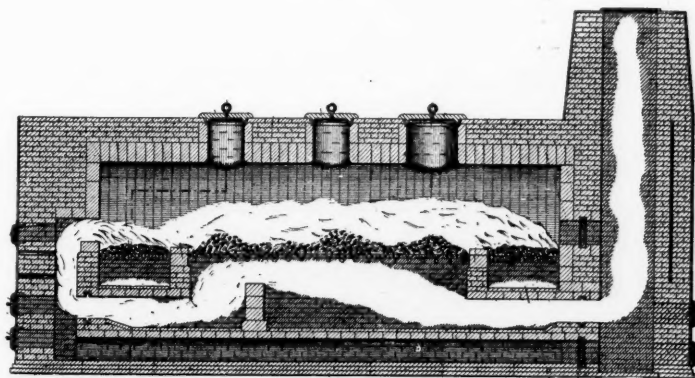


FIG 39. LONGITUDINAL SECTION ENGLE CREMATOR (1892)

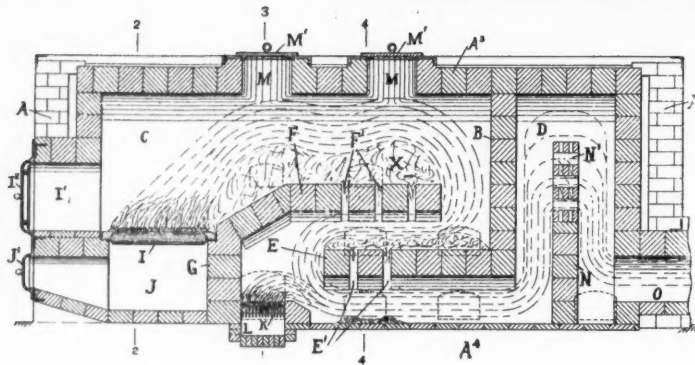


FIG. 40. LONGITUDINAL SECTION MORSE-BOULGER DESTRUCTOR (1899-04)

box. This plant has been in continuous work for nearly nine years, and is fully described and illustrated in this journal for April, 1906.

Though this Boston furnace was for dry refuse, the forms of grates and position of fires made it well adapted for the disposal of garbage. It was improved upon, and many installations for institutions and other private purposes were made by Morse & Boulger up to 1904.

The Boston plant was duplicated with many improvements, at Buffalo, and a large destructor was built at Manila, P. I., with a steam boiler for obtaining forced draft. This was the first instance of this application of blast under ash pits in American disposal work.

In 1902 the business of Morse & Boulger was capitalized under the title of the *Morse-Boulger Destructor Company*, and a new patent taken out 1904. This company held the American rights for the Meldrum Bros.' Destructors, of Manchester, Eng., but did no work under these patents. Mr. Morse retired in 1904, and the business has since been continued by Mr. Boulger as President, Treasurer and Manager, with a nominal Board of Directors. The control of the Meldrum Destructors was assumed by Mr. Morse.

The Universal Destructor Company, N. Y.

In 1906, Mr. W. F. Morse obtained patents for certain new and useful improvements in garbage furnaces. This invention continues the fire-clay grates of the upper tier, but arranges this as an inclined platform (1), beginning at the primary fire box (6), and rising gradually nearly to the roof or upper arch of the furnace. Below this is a second platform, on closed curtain arch (11), that forms a flue (12) for the passage of the smoke and gases, and as this becomes incandescent it radiates the heat to the under side of the grates above, greatly aiding to dry out the moisture and increasing the combustion.

Below this platform is an expanding chamber (9) triangular in shape, extending from the partition or bridge

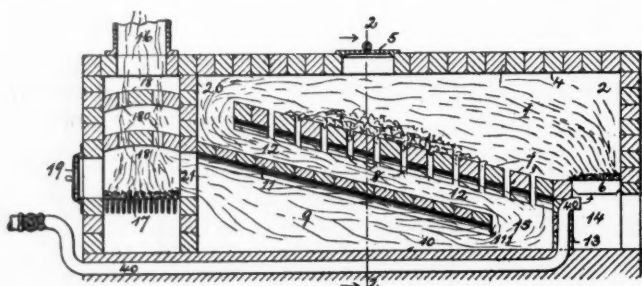


FIG. 41. LONGITUDINAL SECTION MORSE DESTRUCTOR FURNACE (1906)

wall of the fuel box (13) to the curtain wall (21), which encloses the combustion chamber (18) and the secondary fire box (17). Above the secondary fire box in the combustion chamber is a series of transverse arched partitions perforated to admit free passage of the gases.

Beneath the floor of the expanding chamber (10) are conduits of iron (40) extending from the wall of the combustion chamber to the bridge wall under the fire bars of the fuel box. These conduits are controlled by valves at either end. The furnace is charged in the usual manner through circular openings in the roof (5). The primary fire box is provided with special fire bars sloped to continue the same incline of the garbage grate.

At the top of this furnace above the combustion chamber, or at the side or back of this, may be placed a steam boiler of the vertical or horizontal water-tube type having its own independent fire box, and so connected with the furnace by a system of flues and dampers that it may be operated altogether by the crematory, or partly or entirely by the heat from its own fuel box. By enlarging or diminishing the area of either the primary fire or of the sloping garbage grilles the destructor may consume a larger proportion of either refuse or garbage as conditions may require.

The addition of this regenerating system of heating the air brought under the fire bars of the primary fire is a means of increasing combustion not before recognized in American practice. This heated air may be increased to any desired pressure by means of a fan or steam jet, upon the well-known principle of the English destructors, and any proportions of mixed waste, garbage, ashes and refuse may be destroyed without change in the apparatus except by increasing the blast.

The sloping platform, which gradually diminishes the area of the combustion grates, causes a more intimate contact with the heat, and greatly aids in the downward movement of the garbage to the fuel-grate to form additional fuel.

The delay of the gases in the expanding chamber permits the deposit of fine dust, which is withdrawn through doors on the bottom.

There is no iron surface exposed to the direct attack of the heat except the upper surface of the fire bars of the primary and secondary fires. It is believed that the simplicity of construction, and the few essential elements, make it almost impossible to get out of order or to be destroyed by high temperatures unless by gross carelessness.

This destructor may be built in many forms and dimensions suited to the different kinds of waste and differing conditions of service.

The *Universal Destructor Company*, of New York, was organized in 1906 to take over the business and patents of the *Meldrum System of Destructors* and the *Morse Destructor* in this country and Canada. The officers are: W. F. Morse, President; Jno. R. Bradlee, Treasurer, and C. F. Briggs, Secretary, all of 17 State street, New York City.

The Meldrum Simplex Destructor, built at Westmount, Canada, 1905, is described and illustrated in the *MUNICIPAL JOURNAL* for May and December, 1906.

(To be continued)

NEWS OF THE MUNICIPALITIES

**Divers Subjects of General Interest and Their Treatment by City Councils and Officials—Streets, Waterworks
Lighting and Sanitary Matters—Police and Fire Items—Government and Finance**

Roads and Pavements

BALTIMORE, MD.—In furtherance of his policy to make the City Engineer supreme in all matters affecting street paving, Mayor E. Clay Timanus has directed the Sewerage Commission to eliminate from future contracts the provision that the contractors shall relay a pavement after a sewer is built. In the future the contractor will merely fill in the excavation to the satisfaction of the Commission, after which the City Engineer will repave the street, the cost of the same being charged up to the Sewerage Commission. Mayor Timanus also directed that in the future whenever public service corporations are required by the Sewerage Commission to remove tracks, pipes or conduits to make room for sewers, copies of notices must go through the City Engineer's office.

LEXINGTON, KY.—The Joint Improvement Committee of the General Council has decided that all improvements of sidewalks, curbing, etc., shall be by an adopted standard, and that owners of property whose sidewalks are in need of repair shall put down a four-feet wide concrete walk in accordance with an ordinance already in effect but which has not heretofore been rigidly enforced.

DECATUR, ALA.—Preparations are being made under the recent special act of the Legislature for paving a number of streets, amounting in all to about 57,000 feet in length. A large amount of sidewalks and curbing will also be laid. The kind of material has not been selected, but brick or asphalt will probably be used. In the meantime Attorney J. H. Overell, of St. Louis, Mo., who represents holders of \$50,000 worth of bonds, issued nearly twenty years ago and on which no interest has ever been paid, wants to know where his clients come in. The money was used when the bonds were issued to put gravel on some streets—work from which the city received little benefit. In order to determine the desirability of different kinds of pavement Mayor Skeggs and six members of the Board of Aldermen made a trip to Birmingham, a city which is becoming generally recognized as a model in matters of street improvements.

PRATT CITY, ALA.—A movement for extensive street improvements has been inaugurated by Mayor Lacy. Better streets and sidewalks are the new Mayor's pet hobby, and it seems a popular one. "We want better streets," says the Mayor, "and if the next two years don't mark great improvements in that direction, it will not be the fault of the administration." Substantial improvements in sanitation will also be undertaken.

STATEN ISLAND, N. Y.—The widening and straightening of important streets on Staten Island is now occupying the attention of Borough officials, and if the plans presented are carried out the system of roads will be second to none in the country. The widening of Richmond terrace, the leading thoroughfare, is contemplated. The widening of Bay street is a big engineering proposition, as is also the widening of Castleton avenue, which it is planned to cut through to Port Richmond, making one continuous road from Tompkinsville. It is believed that these street improvements will lead the trolley companies to extend their lines to parts of the Borough hitherto neglected.

Sewerage and Sanitation

COVINGTON, LA.—A meeting held under the auspices of the Improvement Committee of the Citizen's League for the purpose of considering means for improving the sanitary condition of the town, was addressed by Dr. Quitman Kohnke, of New Orleans, La., and Hon. F. A. C. Davis, President of the Indianapolis Water Company, of Indianapolis, Ind. Dr. Kohnke advocates a system of house and street drainage of sufficient capacity and urged the appointment of a sanitary engineer to make plans. Mr. Davis advocated a waterworks system with 10-inch mains and 8-inch laterals. He believed, under the circumstances, that a franchise to a private company would be best, but that a municipal supply under a competent manager would also be satisfactory.

GRAND RAPIDS, MICH.—City Engineer Anderson has submitted to Mayor Charles E. Ellis details of the plans for flood protection on which \$1,000,000 will be spent, in case the voters so decide at the spring election. The plan consists of a series of earth embankments and retaining walls along the Grand river. The main East Side sewer will be directed and carried further down the river, where a pumping station will be built for use during high water. Pumps will also be provided for the Canal street sewer, a new South Front street sewer and the West Side ditch sewer. A general cleaning and deepening of the river bed will be necessary and the co-operation of the Federal Government in this work is expected.

JERSEY CITY, N. J.—The first contract for draining the marshes on the Hackensack river by digging twenty miles of ditches has been begun under the direction of State Entomologist John B. Smith. It is hoped to have the work completed by the first of May, in which case Jersey City will experience little trouble from salt marsh mosquitoes. If the work is not done in time, extensive spraying will be resorted to.

PENSACOLA, FLA.—Work on the construction of the sewerage system was stopped by order of the contractor, R. C. Storrie. Excavations already made will be filled. The stopping of the work was followed by the filing of a suit in the Federal Court against the city for \$25,000 damages. In the bill of complaint or petition the contractor charges that the engineer and the Board of Bond Trustees wrongfully and fraudulently conspired together to wrong and injure him and prevent the performance of the contract. The amount of the contract is \$217,000, of which \$37,000 has been paid. The trouble is said to have arisen when the engineer instructed the contractor to work in the lower sections of the city.

SAN ANTONIO, TEX.—At a recent meeting of the Board of Health, Dr. Barratz, the President, said that the sanitary condition of the city was excellent, better than that of any other city in the South. This he attributed to the excellent sanitary methods employed. The only complaints now received are in reference to garbage collection, the system in operation needing some improvement.

TOPEKA, KAN.—Cities of the State are beginning to understand the effect of the law recently enacted increasing the authority of the State Board of Health. That body will have authority over the water supplies and sew-

erage systems of all cities. Every municipality is required to file immediately with the State Board of Health a complete chart showing the location of all sewers, the plans and surveys of all waterworks and a description of the source of water. No city will hereafter be allowed to deliver any sewage from new sewers into any stream without the unanimous consent of the Board. Permits will also have to be obtained for all extensions of waterworks.

WASHINGTON, D. C.—Following out the plan to institute a comprehensive inquiry into the question of sanitation in the District of Columbia and to improve public health and hygiene wherever possible, the Chemical Society of Washington at a meeting held at the Cosmos Club adopted a resolution urging publicity in health instruction. The resolution was presented by the sanitary committee of the society, consisting of H. N. Stokes, E. T. Allen and S. S. Voorhees.

Waterworks

BOSTON, MASS.—A complaint in regard to the waste of water by Boston householders has been made to Mayor John F. Fitzgerald by the Metropolitan Water Board. According to Chairman Sprague, the consumption amounted to 174 gallons per capita in January, and 184 gallons in February. The waste is greater in Boston than any other part of the district. Fifty-two gallons per capita was the consumption in Malden where the supply is largely metered.

GALENA, ILL.—After a three years' fight, the Galena waterworks have become the property of the city. The purchase price and all expenses amount to \$82,780. In taking over the property the city expects to gain in better fire protection through the extension of water mains, in a better quality of water, and in improvements in general sanitary conditions due to the introduction of water into an increased number of households.

HANCOCK, MD.—The Burgess and Commissioners have granted to Arthur Geisler, of New York City, and H. P. Bridges, of Baltimore, Md., a franchise for the establishment of waterworks in the town. The franchise is good for 40 years in case the waterworks are put in. Work must be commenced on the plant within one year and must be completed within eighteen months. The town gets twenty plugs for fire protection, sprinkling, etc. Citizens of the town will be given an opportunity to subscribe for stock in the water company.

MONTREAL, CANADA.—The Water Committee has adopted a report of Superintendent Janin advising the construction of a conduit parallel with the present aqueduct, except that portion of it which has been already widened. The result will be that the city will be able to pump 50,000,000 gallons a day, using water power. This plan is simply a modification of projects recommended at various times since 1873, now made possible by Legislative authority to issue \$2,000,000 bonds. The main items of expense are: Lateral conduit, \$660,000; suction well, \$20,000; extension of conduit into deeper water, \$75,000; excavations, walls, stopgates, etc., \$817,000; purchase of land, \$20,000; widening and deepening tail race, \$45,000; wheel house, new pumping machinery, buildings, \$300,000.

PLATTSBURG, N. Y.—The application of the city to buy the watershed of the water supply has been approved by the State Water Supply Commission, which in its discretion says that this is a move in the right direction. This will furnish a sufficient supply of pure water for the city, Plattsburg barracks, the Catholic summer school and Hotel Champlain. An election to vote on a proposed \$50,000 bond issue for above purpose will be held April 9.

POTTSVILLE, PA.—With the town reservoir full of water, the borough of Schuylkill Haven has been suffering a water famine, consumers being unable to get any water from their pipes. Superintendent Bowen discovered the trouble to be due to a school of fish, which got into the basin, and thence into the pipes in which they stuck, choking off the water supply.

POUGHKEEPSIE, N. Y.—A report has been received of the work of D. W. Pease, Director of the State Hygienic Laboratory in connection with the quality of Poughkeepsie water. According to the figures given, raw water from the Hudson river contains 4,800 bacteria to the cubic centimeter. Tests from the filtered water showed from Filter No. 1, — 150; No. 2, — 1,350; No. 3, — 205; No. 4, — 95. The last analysis being considered as the only wholly satisfactory one, according to the report the water at Poughkeepsie does not lend itself so readily to slow sand filtration as does the river water at Albany. The capacity of the filters, one and a third acres, is considered as sufficient for the present consumption of 3,000,000 gallons a day.

SPRINGFIELD, ILL.—In a report on the condition of the city waterworks, the committee of the Business Men's Association has recommended that plans be authorized for works of sufficient capacity for a city of 150,000 people; that 200 acres of land be purchased along the river near the pumping station for a reservoir and park; that a dam be built across the river to conserve a supply; that pipes be laid in every street or addition where 10 per cent. would be returned on the investment, and that inducements in the way of water service be held out to bring into the city all possible outlying territory.

Street Lighting

DARBY, PA.—Residents of the chain of boroughs from Darby to Chester are rejoicing over the announcement that the Suburban Gas Company will reduce the price of its illuminant from \$1.20 per 1,000 feet to \$1.10. The new schedule will go into effect on the first of May. The present discount of 15 per cent. will continue, which will practically reduce the price of the necessity to less than \$1.

HAMILTON, O.—Hamilton will be one of the best lighted cities in the country, in proportion to its area, when the improvements now going on at the municipal light plant are completed. It is proposed to place a light at every intersection in the city. This will require 94 new lights, bringing the total up to 310. The kind of light has not yet been selected, but the Magnetic lamp, of which Superintendent O'Toole, who recently visited Louisville, Ky., brought back a favorable report, is being considered.

HOOSICK FALLS, N. Y.—Trustee Collins, Chairman of the Light Committee, has agreed upon a lighting contract with the Hoosick Falls Illuminating Company, the main features of which are as follows: The company agrees to furnish for a term of five years not less than 75 arc lights and 14 32-candle power incandescent lights for street lighting purposes at \$62.50 per arc light and \$20 per 32-c.p. incandescent light; 50-c.p. incandescent lights to be \$35 each; these lights to burn all night, and every night, from one-half hour after sunset to one-half hour before sunrise, any arc light not burning for two consecutive hours to be counted out all night and not paid for.

ST. PAUL, MINN.—Three important matters pertaining to lighting have been submitted to the Assembly. One was the report of the commission of experts appointed to recommend a schedule of maximum rates for electricity; another an ordinance by Assemblyman Hass providing for the appointment of a city inspector of gas and electricity, and the third an ordinance by Assemblyman Keller

providing for a reduction in the price of gas to 85 cents. According to the Haas ordinance an inspector will be appointed at a salary of \$150 a month and two assistants at \$75. The inspector must test and pass on the quality of the gas and the accuracy of meters. Inspections must be made of electrical plants and electrical currents which are being supplied to consumers. Monthly reports on these matters are to be submitted to the Board of Works and the Council. The cost of testing a meter is fixed at 50 cents to the consumer; if meters found to be inaccurate are not corrected in ten days, charges cannot be collected from the consumer. The Keller ordinance fixes the price of gas at 85 cents per 1,000 cubic feet.

TOLEDO, O.—The Summit Street Improvement Association has made a proposition to the Council Gas and Light Committee regarding the lighting of a section of that street and the offer has been accepted. The association will install 156 new arc lights on the street—117 more than are there now—and pay all costs except the \$877, which the city has been paying for 39 lamps. The lighting will cost the association over \$6,000 a year. Ornamental poles will be placed, 80 feet apart, on each side of the street, with two arcs on each pole. Eight arcs will be placed on each street corner.

Fire and Police

INDIANAPOLIS, IND.—A bill, recently passed in the Legislature, allows the tax assessment for the benefit of the firemen's pension fund to be increased to not more than 4 cents on each \$100 of taxable property in all cities except Indianapolis, Evansville and Ft. Wayne, the maximum levy in those cities remaining at 1 cent on each \$100. The minimum levy permitted continues to be one-half on each \$100, and the city authorities may fix the levy at any amount they please in excess of that up to the maximum.

LOUISVILLE, KY.—Dr. M. K. Allen, City Health Officer, will shortly issue an order for the annual spring cleaning-up of the city. This year a determined fight will be made against mosquitos and flies, and the county officials will be asked to aid by spreading oil on ponds and cesspools.

MEDINA, N. Y.—The Fire Department house was recently destroyed by fire. When the fire was discovered the entire rear portion of the building, which was of frame, was on fire and the alarm system was rendered useless. The firemen succeeded in dragging a large part of the apparatus out of the building and did good work. The waterworks system lost most of its tools and materials, and even the village water wagon was badly scorched. The fire is supposed to be of incendiary origin.

ST. LOUIS, MO.—Preparations to increase the police force by the addition of 300 men, as provided in the new eight-hour bill which will go into effect in June, are being made by Chief Creecy. The idea being worked out is to have a light watch for the early part of the day, together with a reserve force, and make the second and third watches heavier. This will probably make it necessary for the men on the last two sections to remain on duty on that platoon from two to three months, instead of alternating every month as at present.

Government and Finance

ALTOONA, PA.—Mayor Walker has decided that henceforth there shall be no room in the city for men who will not work. He has ordered the police to arrest every man who is found in the streets of Altoona without visible means of support. All who cannot give a satisfactory account of themselves will be sent to the workhouse for six months. "Work is too plentiful in this town for anyone to be without it, and we don't intend to tolerate any

idleness," said Mayor Walker in explanation of his action.

BUFFALO, N. Y.—Mayor J. N. Adam has called the attention of the Aldermen to the consequential damages that have been awarded property owners on The Terrace on account of grade crossing improvements. Damages of \$157,087 were allowed on property valued at \$470,865, which have been so improved by the work that they are now valued at \$473,635. One piece of property valued at \$19,000 was allowed \$9,000 damages and is now assessed for \$27,000.

BRIDGEPORT, CONN.—The following resolution has been passed: "Resolved, that this Common Council hereby expresses itself as in favor of reasonable Sunday recreation, provided that the same shall not interfere with the personal rights of any citizen, the aforesaid recreation to embrace baseball, football and similar sports and diversions, provided the same are conducted at least a quarter of a mile from the thickly populated districts."

DETROIT, MICH.—Comptroller Joy has suggested that it might be advisable, instead of publishing the official proceedings in the daily papers, to publish a weekly municipal journal containing the proceedings of the Common Council, the Board of Education, the Library Commission, the Fire Commission, the Police Department and the Board of Health, as well as all advertisements, proposals for bids, notices, etc. He suggested that the paper be published every Wednesday morning and be sent free to the various city officials, and mailed to interested citizens who are willing to pay a subscription price of \$1 a year.

GARDINER, ME.—Former City Solicitor Will C. Atkins has been inaugurated as Mayor, and the retiring Mayor, Charles A. Knight, elected as City Solicitor. Mayor Atkins, in his inaugural address, called attention to the need of a building for municipal purposes. Many other towns in the State have had buildings given them by public-spirited citizens, but Gardiner is without a good building suited for public meetings. The new Mayor is a believer in city advertising, and advocates the purchase of space in papers for the purpose of making known the advantages of the town.

GUTHRIE, OKLA.—The new State constitution contains the following provisions regarding municipalities: Cities of 2,000 population or more may frame new charters, upon the people electing two freeholders from each ward, the charter drafted by the Board of Freeholders to be approved by the people at an election. Before the charter is submitted to the people for their approval it must be approved by the Governor. The initiative and referendum is reserved to the people of cities, 25 per cent. of the electors of the city being necessary to initiate measures through petitions to be voted on by the people. Franchises cannot be granted or renewed except by a vote of the people at a general or special election. The people may also initiate franchises, by the 25 per cent. petitions.

HARTFORD, CONN.—The Board of Finance has asked for \$1,614,925 for expenses of the city government during the coming year. Among the items are: Street Department (including garbage and ashes, \$36,933; street cleaning, \$46,000; electric-lighting, \$61,000), \$344,378; Health, \$17,282; Police, \$144,905; Charities, \$109,000; Common Council, \$6,375; Fire, \$163,078; City Officials' Department, \$58,236.

INDIANAPOLIS, IND.—Not one judgment for damages was obtained against the city during the year 1906, and the average cost of disposing of such suits was \$32 each. City Attorney F. G. Matson's report shows that on January 1, 1906, seventy-six litigated cases were pending in which the city was a party. During the year sixty-two additional cases were filed. Eighty-two cases were dis-

posed of during the year. The total damages claimed in the eighty-one cases was \$478,500. In the case of increased awards of damages for street openings and the like judgments against the city amounted to only \$2,718.

SPRINGFIELD, MASS.—The annual budget for the coming year amounts to \$1,360,000, of which the following are the items: Assessors' Department, \$10,900; Auditing Department, \$2,200; Board of Health, \$10,600; City Clerk's Department, \$5,200; Engineering Department, \$10,000; City Library Association, \$36,000; city wires underground, \$2,250; collection of ashes, \$21,000; Collector's Department, \$6,100; election expenses, \$7,500; Fire Department, \$128,000; Forestry, \$12,000; funded debt, \$24,200; highways and bridges, \$160,000; Isolation Hospital, \$4,000; interest, \$63,000; Law Department, \$5,600; lighting streets, \$80,000; Mayor's Department, \$4,300; medical inspection of schools, \$—; Municipal Building, \$4,000; Pauper Department, \$34,000; Police and Watch, \$93,000; printing and stationery, \$2,600; public parks, \$35,000; scavenger department, \$13,000; schools, \$300,000; evening trade school, \$3,000; city property commercial school, \$60,000; cooking school, \$2,800; technical high school, \$22,000; kindergarten, \$16,000; schoolhouse repairs, \$17,500; sewers and drains, \$28,000; sinking funds, \$57,500; soldiers' relief, \$3,500; Treasury Department, \$7,050; walks and curbing, \$10,700; watering streets, \$9,500.

Refuse Collection and Disposal

NEW ALBANY, IND.—The New Albany patrolmen have received instructions to strictly enforce the garbage ordinance which was passed several years ago, but never strictly enforced. In addition to the requirement of the ordinance, homeowners will be required to provide separate receptacles for ashes and garbage. People who throw garbage in the streets will be prosecuted, without further warning.

NEWARK, N. J.—As a part of a plan for cleaner streets, it was decided by the Board of Works that hereafter contractors who deposit building materials on the streets at the scene of their work will have to deposit a sum of money with the Superintendent of Streets. The amount will be sufficient to cover the cost of thoroughly cleaning the street at the given point by the city in the event of the contractor failing to do so after his building work is finished.

NEW ORLEANS, LA.—Mayor Behrman has sent a message to Council calling attention to the growing importance of the garbage question. The present method is antiquated, and he recommends the consideration of modern appliances for disposal. Reference of the matter to a committee for the purpose of framing a specific plan is advised.

WASHINGTON, D. C.—Washington streets will be given extra cleaning during April. Superintendent Toohey states that: "We are now working 196 men, sweeping the streets by hand, but we should have at least 300 to perform the work in the manner we should like to see it done. On the 15th of April, however, we intend to give certain of the downtown streets a double sweeping daily. We have mapped out a section in the northwest from Sixth to Fifteenth streets east and west, and from D to G streets north and south, including Pennsylvania avenue, which we will have swept daily by the men with the hand sweepers, and every night by the horse-drawn machine sweepers. With this double force practically at work night and day we are satisfied that this section of town will be kept as clean as the street surfaces themselves permit. Much of this section should be repaved and resurfaced, and until this is accomplished it cannot be expected that perfect street surface conditions will obtain."

Parks and City Beauty

DETROIT, MICH.—Among the items of the Park and Boulevard Department budget is one of \$50,000 for a new bath-house on Belle Isle, which will be located on the beach a little distance from the east end of the bridge. An appropriation of \$25,545 was made to furnish and equip the new casino. For terraces and other improvements outside of the buildings, \$5,000 was allowed.

MOUNT VERNON, N. Y.—The Board of Supervisors of Westchester County has indorsed the bill introduced in the Legislature by Senator Agnew and Assemblyman Duell to create the new Bronx Valley Parkway and Boulevard running from the Zoological Garden in the Bronx, northward through Westchester county to Kensico Lake. The cost of the improvement is estimated variously from \$1,600,000 to \$6,000,000. Three miles of the Boulevard and parkway will be in the Borough of the Bronx and twelve miles in Westchester.

NEWBERRY, S. C.—The Civic Association of Newberry is actively at work in beautifying the streets and other public places, and in this work the association will have the hearty co-operation of the citizens of Newberry. One of the first moves of the association was to provide three hundred barrels to be used as receptacles for trash and waste matter. These barrels will be painted and placed convenient to the stores.

OWATONNA, MINN.—A Civic League has been formed and plans outlined to make Owatonna one of the most beautiful cities in the Northwest. An order has been placed for 2,000 packages of flower seeds, which will be distributed among the school children. A prize will be offered to the child who at the annual street fair next fall can show the best kept and most tastily arranged flower garden, and another for the best kept lawn. A school children's brigade will be organized to keep the streets free from papers and other articles. Parks are to be laid out and kept in shape near the depots.

WASHINGTON, D. C.—General Mackenzie, Chief of Engineers, has just approved an arrangement made by Col. Bromwell, the Engineer Officer in charge of Public Buildings and Grounds, and Capt. Cosby, the Engineer Officer in charge of the Potomac River Improvement, whereby it is proposed to continue the Riverside drive from its present western terminus to the western extremity of the Potomac Park at Twenty-sixth street, and make direct connection with the existing roadway from Twenty-third and B streets to the sea-wall of the river. Congress provided \$80,000 for the projected extension of the Riverside drive, and has made \$15,000 of that amount immediately available. It has therefore been decided to begin the improvement at once, with a view to its completion during the summer. The sea wall along this portion of the river front is bordered with beautiful willow trees, and they will form a most attractive feature of the new driveway.

Rapid Transit

BROOKLYN, N. Y.—According to estimates of Chief Engineer Rice, of the Rapid Transit Commission, the Brooklyn subway system under the East River as far as the Borough Hall will be in operation some time in June. The remainder of the route from the Borough Hall to Flatbush avenue will be completed and ready for use by September. This work has been delayed by the change in the plans from a two-track to a four-trade subway, the contractors having experienced some difficulty in securing the additional steel.

BUFFALO, N. Y.—Addressing the Aldermen, in asking for the proposed Elmwood franchise, President Henry J. Pierce, of the International Railway Company, announced that on account of its inability to get money the

company had been obliged to abandon over \$2,000,000 of projected improvements in western New York this summer.

NEW YORK, N. Y.—As the result of an agreement between Theodore P. Shonts, the new President of the Interborough-Metropolitan Company, and Corporation Counsel Ellison, unused street car tracks, some twenty-five miles in length, will be removed from the city. These tracks are in Amsterdam avenue, between Seventy-second and 129th streets, and a number of shorter lines in the lower section of the city over which one car is run each day in order to hold the franchise. The city on its side agrees to recognize the existence of the franchise right and permit the relaying of the tracks at some later time under proper conditions.

NEW YORK, N. Y.—A new and simple device to protect travel in the subway and incidentally to protect the subway itself, is now being installed in the shape of steel strips connecting the supporting pillars on the sides next to the tracks, both express and local. These steel strips safeguard the cars in case a train jumps the track from being raked by the pillars and smashed in by impact.

Miscellaneous

BALTIMORE, MD.—Space on Baltimore's new system of piers may be rented on a basis of 25 cents per square foot a year, in order to bring in an annual amount sufficient to meet the expenses for construction. As a 50-foot street runs down the middle of each pier, a charge for half the roadway will have to be added to the actual area occupied by each tenant. The net cost of land and improvements was \$2,858,545, which with the cost of docks and piers brings the total on which interest must be carried, up to \$3,895,615. The annual expenses, interest, sinking fund and lost taxes amount to \$224,100. The total area of docks, including roadway, is 896,114 feet.

HARTFORD, CONN.—Preliminary plans for a new City Hall, prepared by Brocklesby & Smith, architects, have been sent to the Common Council by the committee having the matter in charge. A seven-story fireproof structure, with facings of granite approximately 40 by 65 feet, is estimated to cost \$160,000. The lot to be used, the present site of the Hall of Records, is not a perfect rectangle.

JOLIET, ILL.—Replies to inquiries about public markets have been received from twenty-five cities. The following are brief points of some replies: Peoria has a private market. Cincinnati has four markets run at a profit and patronized by all classes. The market tends to lessen the cost of produce considerably to the consumers. They have 800 hucksters at the curb paying \$13 per year each. Akron, Ohio, has a market on a paying basis. Dayton, Ohio, has a public market patronized by all classes. At Springfield, Ohio, the market runs about even, and, while they do not think it lowers prices much, they regard it as a great benefit. Kansas City, Kan., has a private market which has run one year successfully. The city gave two lots to start it. At Fort Wayne, Ind., the market house was torn down some years ago to build a City Hall on the site, but they are planning to build a market house again there. Labor unions were found to generally favor public markets.

NEW YORK, N. Y.—The Commissioners of the Sinking Fund have approved a plan presented by Dock Commissioner Bensel for improving the Hudson River water front from 153d to 158th streets. The improvements are to consist of a marginal street, bulkhead, piers and a ferry house, as Mr. Bensel reported that he had one application for a ferry to Fort Lee. The work will incidentally wipe out a bath house and refreshment pavilion.

MAYORS' RECOMMENDATIONS

IN a considerable number of cities of the country the Mayors, at the beginning of the year, present in addresses to Councils reviews of the previous year and recommendations for the future. A review of these gives a birds-eye view of certain phases of municipal activity, and a considerable number received by the MUNICIPAL JOURNAL have been analyzed and their more important points classified under several heads. It is imperative, of course, that this analysis should present but the barest skeleton of the ideas treated.

STREETS AND PAVEMENTS

The Mayors of Gloucester, Lawrence, North Adams, Pawtucket and Taunton, in New England, and of Buffalo, Detroit, Toledo and Atlanta, call especial attention to the necessity for abolishing grade crossings; while in Worcester such work is now under way, and in Waltham will begin this spring.

Next in order of interest appears to be the question of sidewalks. Fall River last year laid more cement sidewalks than ever before; the Mayor of Augusta, Ga., urges the laying of such walks; Syracuse laid 46 miles of cement, stone and tar sidewalks, and is rapidly doing away with wooden ones. Chester, Pa., and Gloucester are mulcted in considerable amounts for damages due to defective sidewalks—sufficient to keep them in repair, probably. Among other points referred to, it is suggested that Cambridge cleans her streets oftener and sprinkles them during a longer period of the year; that in Fitchburg excavations in streets made by public service corporations be under the supervision of the Street Commissioner, whose expense should be paid by said corporations; that Haverhill secure its own stable, sheds, etc., and a storage yard on the river front, to reduce the cost of maintenance of the Street Department; in Lynn, that streets should be laid out on a comprehensive plan and not according to individual ideas of owners; that Camden compel the street car companies to remove all unused tracks; that Hazleton adopt a systematic method of street cleaning, appropriating in advance at least \$1,800 for that purpose; that in Buffalo a vehicle tax be laid to meet street repairing, and that repairing be paid for entirely by local assessment; in Rome, that sanding of sidewalks and keeping gutters open be considered as a branch of the city's public work; also that the initiative in paving rest with Councils rather than with the property owners, since the city pays one-third of the cost of this work, and that the matter be decided by a referendum; and that Reading own an asphalt repair plant. Approving mention is made of the reduction in cost of paving in Evansville, of the success of "white wings" and waste-paper cans in keeping Toledo's streets clean; and of the general obedience in Rochester to the traffic ordinance.

SANITARY

The Mayors of Concord, N. H., Fall River, Lawrence, New Bedford and Worcester, Mass., Syracuse, N. Y., Hazleton, Williamsburg, Pa., call attention to the necessity for extending the sewer system; those of Taunton,

Pawtucket and Worcester, Mass., Rome, N. Y., and Altoona, Pa., for installment of sewage disposal plants or enlargement of the present ones; while Reading's Mayor refers to the approaching completion of lateral sewer extensions and a complete sewage disposal plant; and the necessity for Passaic to cease discharging her sewage into the river, and for Hoboken to install a pumping plant to drain the meadows are referred to. A plumbing inspector is recommended for Reading, a biological laboratory for Toledo; a public comfort station, inspection of barber-shops, medical inspection of schools, and stricter enforcement of the pure food laws for Providence; a sanitary ordinance covering milk and food for Evansville. Fall River needs isolation hospitals and ambulance surgeons, and Boston a consumption hospital.

WATERWORKS

Pittsfield, Mass., it is stated, must have an increased water supply, as must Lebanon, Pa., and Atlanta, Ga. For Syracuse a second conduit from the lake is recommended. For Waterbury, Conn., an increased supply and division of the distribution system into three levels will soon be necessary. Worcester expects to increase her supply, and increased capacity of mains from Holden reservoir is necessary. At Waltham the plans outlined fifteen years ago will be completed with the termination of work now under way.

Litchfield's Mayor believes the department receipts should be sufficient to pay the interest on the water debt as well as the maintenance expenses; while the Mayor of Providence thinks the rates should be decreased. Pawtucket's water supply is profitable, but should be extended. The waterworks of Evansville is stated to be the city's most valuable asset. Syracuse waterworks bonds should not, in the opinion of the Mayor, be included among the liabilities which limit the debt capacity of the city. In Rochester 5,500 new meters have been placed. In Fitchburg it is considered undesirable that the meters should be private property, as is now the case.

At Fall River 95 acres have been bought to protect the water shed. For Fitchburg, Wachusett lake and the additional water supply will soon be available. It is recommended that North Adams purchase a water shed and build a reservoir thereon. Rochester has under way great improvement in her water storage and protection of the water sheds. Altoona has begun construction of her storage reservoir. A new filter is recommended for Lawrence at once, so that they need not purchase their supply from other municipalities. Plans for filtering the rest of Reading's supply have been submitted, which will require ten years for execution. Toledo's Mayor recommends that the pumping plant install automatic stokers to prevent smoke and save fuel.

STREET LIGHTING

After investigating conditions at Woonsocket, R. I., expert recommended a rate of \$1.10 instead of \$1.45 for gas, and it was suggested that the company, having no franchise, be considered a trespasser on the street if it refuse to grant this reduction. Buffalo has made a new contract for arc lamps at \$50 per year, \$75 where the

wire is underground. Toledo's recent contract was for \$45, the old rate having been \$83.

In Fall River the old style lamps have been replaced with boulevard lamps, and it is believed that few cities are so well lighted. The North Adams franchise is considered very favorable. Newark's Mayor is opposed to a municipal plant, and favors fair play for the Public Service Corporation. At Hazleton a franchise is to be granted for reasonable payments to the city, including free lighting of the city buildings.

The Mayor of Syracuse favors a referendum to decide whether city should undertake municipal lighting, is opposed to leasing the lighting company's property, and says the gas is below standard. It is recommended that the Detroit lighting company be investigated and a reasonable rate fixed; also that permission be obtained from the legislature for the municipal plant to engage in commercial lighting. It is recommended that a commission be appointed to supervise Chicopee's municipal electric-light plant; that the lines of Taunton's municipal system be extended; that Evansville establish a municipal plant; that an estimate be obtained of the cost of such a plant for Camden and commercial lighting furnished by Paducah.

FIRE AND POLICE

In Pawtucket most of the fire apparatus and all the engine houses but one are new. In Manchester more engines are needed; in North Adams the service should be extended to the suburbs. In Rochester a new alarm system is being installed; fire department repair shops have proved economical and done good work. It is advised that Reading fire companies also make repairs in their own shops; also that the establishment of a paid fire department would result in lower insurance rates. Bayonne had abolished the volunteer Fire Department and secured reduction in insurance rates. Passaic had purchased a hose-drying machine, but had not used it. Gloucester was credited with a good fire department and few fires. Toledo needed a fire boat.

In Providence an equalizing of pensions for firemen and police was recommended. An old-age pension was recommended for the police of Middletown, Conn.

Atlanta's Mayor advocates election of Chief of Police by the Council, and that he be a member of the Police Board; Weehawken's that the police be made independent of politics; Buffalo's, that they clean the city of dives, although the Department itself was praised for efficiency. A police signal system was said to be needed for Central Falls, R. I.; a telephone system has been adopted in Toledo; a better system is wanted in Waterbury. Worcester wants a new police station in the center of the city, as does Taunton. Toledo wants sanitary improvements in the police prison; Rochester has substituted two electric patrol wagons for horse vehicles, resulting in better sanitary conditions and ventilation at the barn at police headquarters. Waterbury and Williamsport want more police. Altoona, Camden, Reading and Toledo want mounted police. The last named has adopted a new uniform. In Toledo the parole system has been adopted, and the indeterminate sentence is favored.

REVIEW OF THE PERIODICALS

Abstracts and Synopses of the Most Important Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading United States Periodicals and a Few Others

Danger in Boiled Water

THE *Literary Digest* for March 2 prints a translation from an article in *Cosmos* in which the writer enlarges upon some ideas concerning boiled water to the discouragement of that practice. While microbes are probably killed, the spores are not. Also, even admitting that boiling sterilizes water, it does not make it a perfect beverage, because it is deprived of air normally held in solution, and is made heavy and indigestible by this de-aeration; because the carbonates of lime are precipitated, which injures its flavor, and the earthy matters in suspension are precipitated, which makes it insipid. Boiling water is not relied upon by surgeons for rendering it sterile, and cannot therefore be for making it potable. The only safety lies in heating under pressure; raising the water to 265° to 300° Fahr., preventing the escaping of the dissolved air and the precipitation and separation of the soluble compounds. Thus prepared, says the writer, water will not produce stomach and intestinal troubles, as it frequently does when boiled in open vessels.

All of which may or may not be true. The tastelessness, at least, may be avoided by substituting a Pasteur filter for boiling, but a city whose water needs either is criminally remiss.

German Municipal Slaughter-houses

PREFACING a description of the municipal slaughter-houses of Berlin, the *Yale Review* for February gives the history of such institutions in Germany beginning with the action of guilds in 1276, forbidding slaughtering in private buildings. The author, Mr. Robert C. Brooks, believes that, while the question of the advisability of municipal construction, ownership and control in the United States is open to question, a discussion of the excellent German methods would furnish valuable suggestions for us. He traces the history of the movement through the reforms inaugurated by Napoleon in 1810, the model laws of Prussia in 1868, to the German laws of 1881 and 1893, which are considered as approximating perfection for that country. The law of 1868 placed under government control all slaughtering in cities, but no supervision was had over that outside of them nor over importations from such into the cities. This defect was remedied by the laws of 1881 and 1893, and the number of municipalities which took advantage of the law increased from ten in 1880 and seventy-one in 1886 to three hundred and forty-one in 1898 and seven hundred and thirty-five at the present time.

The provisions of the German law are set forth in detail, and an extensive description is given of the mu-

nicipal slaughter-houses of Berlin, in which nearly two million animals have been slaughtered in a year.

Municipal Ownership of Street Railways

THE article in the March *Review of Reviews*, by Edward T. Heyn, on "The Municipal Ownership of Street Railways in Germany," contains a quantity of interesting facts and statistics. It is a frank effort to present the experiment as a success; but it cannot be said that the author succeeds in his attempt. His figures show very clearly that only rarely is it a success financially, and while the financial measure is not the most important one, in the case of municipally conducted railways, it is the easiest to compute and in a statistical article is the most striking. The author can hardly expect to win recruits by such statements as this, for instance: "Municipal ownership has also proved a decided success in one of the most prosperous cities of Germany, the Rhenish city of Dusseldorf, with a population of 200,000 people. Its financial returns since the assumption of the street car lines have been most favorable, and in 1905 it succeeded not only in paying a deficit of the previous year, amounting to \$79,000, but also in leaving a balance of \$600 in the treasury." He notes that in Beleafeld last year there was a net profit in operating of \$19,000, and adds that fixed charges required all of this and \$7,000 besides. In Cologne, he says, a profit of \$65,000 in 1903 was reduced to \$4,400 in 1904, largely because "interest had to be paid on the building of new lines." The facts that the cities pay their street railway employees relatively high wages, and in several cases construct houses for some of them, are mentioned; but these are social enterprises which do not necessarily belong to municipal ownership. The relative rates of fare, the efficiency of the service, and the opportunities to direct traffic and influence growth with a view to the general welfare of the whole community, instead of to that of the stockholders, are considerations more important than any of the foregoing. These are either ignored in the article, or barely hinted at. There is, however, an interesting, but not very clear, account of the difficulties and obstacles met with in attempting to take over the street railways of Berlin.

Municipal Trading in Glasgow

BENJAMIN TAYLOR, who is an editorial writer for the *Glasgow Herald*, contributes to the *North American Review* of March 15, a frank and definite article on the varied municipal undertakings of the city of Glasgow. Municipal trading he defines, in the words of Professor Nicholson, as covering "all the operations of any local authority which, if undertaken by a private company, will be expected to pay a profit. It excludes many forms of

municipal enterprises which require large capital outlay and involve an annual charge, such as poorhouses and asylums, public parks, municipal buildings, etc., in which municipal enterprise is rather to be compared with private benevolence than with private trading." This is a convenient definition of a phrase somewhat vaguely used by most writers. The article points out that the water operations in Glasgow have been "splendidly engineered," and that "the gas undertaking is fairly prosperous and wholly efficient"; that the electric lighting hardly manages to pay its way, and that the telephones department—now sold to the general post-office at a serious loss to the municipality—was "a huge blunder." Finally, the tramway management, "the pet scheme of the Glasgow corporation," has been a great success. But it is hinted that, to render it so, everything is made easy for the tramways, the street department carrying undue burdens. Furthermore, it is pointed out by the writer that to distribute most of the profits—as the municipal tramways of Glasgow do—"in reduced fares, longer haulage and improved service," is by no means the same thing to the rate payer as are direct contributions to the municipal revenue. "The tramways are used by non-rate payers, outside dwellers and visitors, as much as, perhaps more than, by the rate payers, whose money provided the system." In short, the article pretty efficiently argues for the contention with which it starts out, that Glasgow, while "a very well managed city, as modern cities go, is very far from being self-supporting." Mr. Taylor is not in sympathy with municipal trading experiments, and he makes more of failures than of successes, points to steadily rising tax rates, and to a falling rate of growth in population. His article, though most interesting and replete with figures and facts, is hardly an unbiased discussion.

Advice Concerning Municipal Ownership

"The town of Santa Clara has the only municipal gas plant on the Pacific coast, so far as known to the writer," says Mr. C. E. Moore, Consulting Engineer to the town, in charge of the water, electric and gas plants. In an article in the *Water and Gas Review* for February he then reviews the experience of the town in running a gas plant, which was purchased from a private company which had previously operated it. He concludes as follows: "The conviction of the writer is that a municipality should hardly be advised to undertake the management of plants solely for the sake of profit, as an individual or company may do. There should in general be other and stronger reasons. In the case of water there often are such reasons. As we leave water supply and look along the line of other utilities, we find that in general these causes have less force. "A municipality, like an individual, should act with judgment and upon competent advice, and not be carried away by impulse in either direction."

Taxing the Unearned Increment

A VERY interesting account of the current effort in certain German cities and towns to restore to the community, by a tax, some part of the "unearned increment" that has

been added to land values by the community's own growth is contained in the March *Review of Reviews*. The article, "German Experiments with the Land Tax," is by William C. Dreher. The "increment tax" system, as he calls it, has been adopted in Frankfort-on-the-Main, Cologne, Essen, and various other places; and the discussion of it rages throughout Germany. The tax is levied at the time of a transfer, but in Cologne, where there is consideration of the increment that has accrued only since the law took effect, the tax is retroactive. Usually the last previous sale is made the starting point from which to measure the accrued value. Frankfort, however, goes back no more than five years for improved property and ten years for unimproved, and in all towns the amount of the tax is moderated by the lapse of time between the transfers. It is usual to remit one-third if ten or twenty years have elapsed and two-thirds for longer periods. Rapid rises in value are thus hit hardest. The point at which there is assessment of the increment tax also differs. Generally it begins at a 10 per cent. increase, though Frankfort levies the tax on no accretion of value less than 30 per cent. The rates range from as low as 3 per cent. to as high as 25 per cent. on the increase. In Cologne the rate begins with 10 per cent. and reaches its maximum of 25 per cent. when the increment amounts to 160 per cent. Sales to direct heirs, in estate settlements, are usually exempt; and in determining the amount of the increment, deductions are generally made for taxes paid and for local improvement assessments. In most towns interest at 4 per cent. on unimproved property is deducted from the tax.

Safety Devices on Street Cars

JOHN P. FOX contributes to *Everybody's* for March an article on "The Needless Slaughter by Street Cars." This is a subject of which he has made a special study, in this country and in Europe, and his recommendations looking to greater protection of life are concrete and practical. How much they are needed, is shown by his statistics. In Greater New York last year the total number of persons admittedly killed by the street cars was 227; in London in 1903, the last year of which he has record, the number was 10. In Los Angeles in 1906 the deaths thus caused were 75; while in Liverpool, where the tram traffic was heavier than in Los Angeles by nearly one-fifth, the number killed was 4. It is clear that our cars do kill more persons than necessary, for Mr. Fox assures us that these statistics are no more than typical. The devices which he especially commends are two; one is an unpatented and simple fender, used in Liverpool, to box in the wheels. It consists of boards about ten inches high, coming close to the ground and shaped like a long snow-plow in front and behind. The points are rounded and covered with rubber hose to act as a cushion. The whole is supported from the axle-boxes, so as to keep a fixed height above the pavement. The second device is the magnetic brake. This, for the most part, is made in this country; but almost wholly for export. Finally, he notes that in Berlin every car carries a full equipment of emergency tools. The article is a strong plea.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Periodicals Listed Below

- Acetylene Journal, Chicago.
 Ainsley's Magazine, New York.
 American Academy of Political and Social Science, Annals, Philadelphia.
 American Architect, New York.
 American Banker, New York.
 American Gas Light Journal, New York.
 American Homes and Gardens, New York.
 American Institute of Architects, Bulletin, New York.
 American Institute of Electrical Engineers, New York.
 American Magazine, New York.
 American Society of Civil Engineers, Proceedings, New York.
 Appleton's Magazine, New York.
 Architects' and Builders' Journal, Baltimore.
 Architects' and Builders' Magazine, New York.
 Architectural Record, New York.
 Architectural Review, Boston.
 Arena, Trenton.
 Associated Engineering Societies, Journal, Boston.
 Atlantic Monthly, Boston.
 Brick, Chicago.
 Broadway Magazine, New York.
 Canadian Municipal Journal, Montreal.
 Cement, New York.
 Cement Age, New York.
 Century, New York.
 Charities, New York.
 Clay Record, Chicago.
 Clay Worker, Indianapolis.
 Construction News, New York.
 Consular-Reports, Washington.
 Contract Journal, London.
 Cosmopolitan, New York.
 Country Life in America, New York.
 Craftsman, New York.
 Department of Labor, Bulletin, Washington.
 Eclectic Magazine, New York.
 Electrical Railway Review, Chicago.
 Electrical Review, New York.
 Electrical World, New York.
 Engineer, Chicago.
 Engineer, London.
 Engineering-Contracting, New York.
 Engineering and Mining Journal, New York.
 Engineering Magazine, New York.
 Engineering News, New York.
 Engineering Record, New York.
 Engineering Review, New York.
 Engineering Soc'y of West. Penn., Pittsburgh.
 Engineering World, Chicago.
 Engineers' Club, Proceedings, Philadelphia.
 Everybody's Magazine, New York.
 Far Eastern Review, Manila.
 Financier, New York.
 Fire and Water, New York.
 Fireman's Herald, New York.
 Forum, New York.
 Franklin Institute Journal, Philadelphia.
 Gardening, Chicago.
 Gesundheits Ingenieur, Munich.
 Good Roads, New York.
 Harper's Monthly, New York.
 Harper's Weekly, New York.
 House and Garden, Philadelphia.
 House Beautiful, Chicago.
 Illuminating Engineer, New York.
 Independent, New York.
 Indian and Eastern Engineer, Calcutta.
 Insurance Engineering, New York.
 Iron Age, New York.
 Lippincott's, Philadelphia.
 Literary Digest, New York.
 Local Government Journal, London.
 McClure's Magazine, New York.
 Manufacturers' Record, Baltimore.
 Metropolitan Magazine, New York.
 Municipal Engineering, Indianapolis.
 Municipal Journal and Engineer, New York.
 Municipal Journal, London.
 Municipal World, St. Thomas, Ont.
 Munsey's Magazine, New York.
 Moody's Magazine, New York.
 New England Magazine, Boston.
 New England Water Works Ass'n Journal, Boston.
 North American Review, New York.
 Outlook, New York.
 Pacific Monthly, Portland, Ore.
 Pacific Municipalities, Santa Clara, Cal.
 Park and Cemetery, Chicago.
 Pearson's Magazine, New York.
 Popular Science Monthly, New York.
 Power, New York.
 Preventive Medicine Journal, London.
 Progressive Age, New York.
 Public Health, London.
 Public Service, Chicago.
 Putnam's Magazine, New York.
 Review of Reviews, New York.
 Revista Municipal, Havana.
 Rock Products, Louisville.
 Sanitary Institute Journal, London.
 Saturday Evening Post, Philadelphia.
 Scientific American, New York.
 Scribner's Magazine, New York.
 Street Railway Journal, New York.
 Suburban Life, Boston.
 Success, New York.
 Sunset, San Francisco.
 Surveyor, London.
 Technique Sanitaire, Paris.
 Times Magazine, New York.
 Tradesman, Chattanooga.
 Travel Magazine, New York.
 Van Norden's Magazine, New York.
 Village, Hyde Park, Mass.
 Water, London.
 Water and Gas Review, New York.
 World To-day, Chicago.
 Western Municipal News, Winnipeg.
 World's Work, New York.

ROADS AND PAVEMENTS

Paving Brick.—What Constitutes a First-Class One. Paper before National Brick Manufacturers' Association, by William P. Blair. With discussion. 3 pp. Clay Record, Feb. 14.

Sheet Asphalt Pavements.—Detailed description of the process of manufacture. 3 1-2 pp. H. C. Innes. Municipal Engineering, March.

Sheet Asphalt Specifications. Abstract of those prepared for the city of Washington, D. C. 1 3-4 pp. Municipal Journal and Engineer, March 6.

Hassam Pavement at Lynn.—Description of laying. 1-2 p. Good Roads Magazine, March.

Tar as a Dust Preventor.—Illustrated. 1 1-4 pp. Good Roads Magazine, March. Tarring Heavily Traveled Macadam Streets in Chicago. Methods, cost and result. 1 1-3 pp. Engineering Record, March 16.

Oiled Roads in Boston Parks.—Successful experiments in oiling. J. A. Pettigrew. 1-2 p. Park and Cemetery, March.

Suburban Streets and Roads.—Various methods of improving roadways by paving and dust-laying briefly described. Illustrated. 3 pp. Municipal Journal and Engineer, March 6.

Heavy Grades, Pavements On.—Experience with various kinds. Abstract of paper before Illinois Society of Engineers and Surveyors. By C. G. Anderson. 1 1-2 pp. Engineering News, March 14.

Concrete Curb and Gutter.—Cost of constructing at Ottawa. From city engineer's report. 3-4 p. Engineering-Contracting, March 13.

Gutter and Curb, Concrete. Design giving 3-inch gutter depression at curb. Illustrated. V. W. Dow. 1-3 p. Engineering News, March 21.

Cement Sidewalks.—Some remarks concerning and method of constructing. Paper before National Association of Cement Users, by Albert Moyer, 4 pp. Cement Age, March.

Cement Sidewalk Experiences. Paper before Iowa Association of Cement Users, by E. Kenney. 1 p. Iowa Engineer, January.

Cement Sidewalk Specifications. Those recommended by National Association of Cement Users. 1 p. Municipal Journal and Engineer, March 6.

Special Roadways.—Metal trackways, special motor ways, etc., for roads. "The King's Highway." Reginald Ryves. 2 pp. The Surveyor, March 15.

Track Construction at Hot Springs.—Creosoted ties on grouted broken stone.

Illustrated. 1-2 p. Street Railway Journal, March 23.

Street Track Construction in Ft. Wayne. Description of four styles for use of T rail permitted by Council. Illustrated. 2-3 p. Electric Railway Review, March 23.

Width and Safety of Roads.—Discussion of practical considerations, traffic, etc., and their relation to desirable width. Illustrated. "The King's Highway." Reginald Ryves. 4 pp. The Surveyor, March 1.

Cross-Section, Proposed Pavement.—Abstract of paper before Connecticut Society of Civil Engineers, by H. H. Gladding. Illustrated. 1-2 p. Municipal Journal and Engineer, March 6.

Wear and Care of Roads.—Discussion of macadam maintenance. "The King's Highway" (continued). Reginald Ryves. 2 1-4 pp. The Surveyor, March 8.

Effect of Automobiles on Roads. Discussion of injury done to roads. James H. Macdonald. 1 3-4 pp. Good Roads Magazine, March.

Weed Killing in Roads.—Description of practice in California. 1 p. Pacific Municipalities, January.

Traction Resistance.—Discussion of experiments, described by C. H. Hudson before Western Society of Engineers, 1-2 p. The Surveyor, March 15.

Concrete Culverts and Bridges.—Paper before Iowa Association of Cement Users, by T. H. MacDonald. 5 pp. Iowa Engineer, January.

Highway Traffic in Illinois.—A Census Of.—Abstract of paper before Illinois Society of Engineers and Surveyors, by A. N. Johnson. Amounts of traffic near three cities. Illustrated. 3-4 p. Engineering News, March 21. 1 3-4 pp. Engineering Record, March 16.

SEWERAGE AND SANITATION

Drainage System of Calcutta.—Description of past conditions and present system (continued). Illustrated. J. Ball Hill. 4 pp. Indian and Eastern Engineer, February.

Sewage Disposal.—Discussion of recent papers by Dibdin and Scott-Moncrieff on this subject. 1 p. The Surveyor, March 8.

Septic Tank Process.—Notes On. Paper before Canadian Society of Civil Engineers, by W. R. Butler. Review of history and present practice. 3 1-2 pp. Contract Journal, March 6.

The Problem of Sewage Disposal, and the Septic Tank. Discussion by manager of Cameron Septic Company. 2 1-2 pp. H. D. Wyllie. Engineering World, March 1.

Sewage Disposal at Hanley, England. Brief description of Septic Tank and Filter plant. 1-4 p. Municipal Journal and Engineer, March 27.

Bacterial Action and Chemical Constitution of Sewage. Discussion of sludge problem and septic tanks. A. Vincent Elsdon. 1 1-4 pp. Water, March 15.

Sprinkling Tanks. Trouble from frozen sprinklers. Successful English devices described. Illustrated. 1 1-4 pp. The Surveyor, March 1.

Bacterial Treatment of Sewage, with special reference to the biolysis of organic nitrogen. Illustrated. Paper before Royal Sanitary Institute by W. D. Scott-Moncrieff. With discussion. 3 pp. The Surveyor, March 8. 2 1-2 pp. Contract Journal, March 6.

Disposal of Sewage and Roof Water on unsewered premises in Havana. New regulations providing for individual septic tanks and absorption basins. 1-2 p. Engineering News, March 14.

Slate Beds for Sewage Treatment. Editorial discussion on recent paper by Dibdin on experiments with these. 1 p. The Surveyor, March 15.

Sewage Purification. To what extent must it be performed by municipalities? Paper before Royal Sanitary Institute by Dr. George Reid. With considerable discussion. 4 1-2 pp. The Surveyor, February 22.

Sterilizing Sewage Effluents.—Paper before Society of Engineers (England), by W. Pollard Digby and H. C. H. Shenton. Considers necessity for and methods of sterilizing (continued). 2 1-4 pp. Water, March 15.

Sterilizing Sewage. Defense of criticisms of the above paper by the authors, Digby and Shenton. 1 p. The Surveyor, March 15.

Maintenance of Sewage Filters in Winter. Paper before Boston Society of Civil Engineers, by Geo. E. Bollinger. 3-4 p. Engineering World, March 22. 1-2 pp. Engineering Record, March 9.

Sewage-Testing Apparatus Used by Scott-Moncrieff.—From paper before Sanitary Institute. 1 1-2 pp. Contract Journal, March 13.

Experimental Sewage Treatment Works.—Description of those at Baltimore. 2 1-2 pp. Description of those at Waterbury, Conn., by William Gavin Taylor. 4 1-2 pp. Editorial, 1 1-2 pp. Engineering News, February 28.

Sewage Experiment Station. Illinois State Department using Urbana septic tank for this purpose. Illustrated. 3-4 p. Municipal Journal and Engineer, March 20.

Reinforced Concrete Sewer. Cost of.—Method of construction and detailed cost. Abstract of paper before Indiana Engineering Society by M. L. Morris. 1-2 p. Engineering Record, March. Municipal Journal and Engineer, March 27.

Reinforced Concrete Sewer at St. Louis. Brief description, giving all dimensions. 1 1-2 p. Cement and Engineering News, February.

Reinforced Concrete Sewer of Unusual Section. Used in Brooklyn, N. Y., for combined sewer. Illustrated. 1-3 p. Engineering News, March 14.

Reinforced Concrete Sewer. Method and cost of constructing one in South Bend, Ind. 1-3 p. Municipal Journal and Engineer, March 27.

Concrete Sewer. Description of constructing a 72-inch reinforced concrete sewer in South Bend, Ind.

Sewer Tunnel.—The Bronx storm relief sewer. Description of construction of this sewer. 14'x18'-8". Illustrated. 3 pp. Engineering Record, March 2.

Sewer Tunnel. Description of carrying 33-inch sewer 4,700 feet in tunnel.

Typhoid at Washington, D. C.—Abstract of report of Government commission. Editorial comment on the same. 1 1-4 pp. Municipal Journal and Engineer, March 27.

Typhoid and Tuberculosis, Struggles of the Cities Against. A symposium covering Glasgow, New York, Philadelphia, Buffalo, Cincinnati, Detroit, Washington and Providence. 20 pp. Annals American Academy of Political and Social Science, January.

Pollution of Passaic River.—History of agitation to prevent this, with provisions of bill just passed. 2 1-4 pp. Municipal Journal and Engineer, March 27.

Sewage—Polluted Ice. Editorial on the dangers from. 1-2 p. Municipal Journal and Engineer, March 6.

Pasteurizing Milk.—Discussion pro and con relative to treating all of New York City's supply. 1 3-4 pp. The Outlook, March 16.

Pure Milk for New York. Discussion of the subject. 1 p. The Outlook, March 23.

"The Social Settlement and Public Health."—By Alice Hamilton, M.D. 4 pp. Charities, March 4.

Traps on House Drains.—Editorial adverse to. 3-4 p. Abstract of paper favoring, by M. O'Connor, and of one opposing by Chas. B. Ball, before American Society of Inspectors of Plumbing and Sanitary Engineers. 3 pp. Municipal Journal and Engineer, March 20.

Intercepting Traps. Editorial on recent papers in this count—discussing their use pro and con. 1-2 p. The Surveyor, March 15.

Compulsory Use of Intercepting Traps. Paper advocating this before American Society of Inspectors of Plumbing and Sanitary Engineers, by M. O'Connor. 1-2 p. The Surveyor, March 15.

Sewage Ejector, Hydraulic.—Description of novel one installed at Duluth. Illustrated. E. A. Wilson. 1 p. Engineering Record, March 9.

WATERWORKS

Waterworks in Smaller Cities.—With special reference to fire protection. Geo. W. Boot. 3-4 p. Fire and Water, March 2.

Water Supplies for Small Cities. Paper before Association of Engineers-in-Charge, by C. H. Shenton (continued). 2-3 p. Local Government Journal, February 23.

Small Water Supplies. The distribution system (concluded). H. C. H. Shenton. 2 3-4 pp. Water, March 15.

Waterworks of Muskogee, I. T. Description of pumping plant, purification and river crossing. Illustrated. 2 pp. Municipal Journal and Engineer, March 6.

Los Angeles Proposed Water Supply. Popular description of the Owens river supply and conduit. Illustrated. 12 pp. Bronson C. Keeler. Moody's Magazine, March.

London's Water Supply. Discussion of advisability of obtaining water from Wales. 1 p. Contract Journal, February 20.

"New York's High Pressure Water System." By Thomas F. Meade. 6 pp. Illustrated. Van Norden Magazine, March.

Water Purification Works of Columbus, O.—Contractor's plant and methods of construction. Illustrated. George E. Howe. 2 1-2 pp. Engineering Record, March 2.

Mechanical Filters at Harrisburg, Pa. Description of plant; from annual report of 1906. Illustrated. 4 3-4 pp. Engineering Record, March 9.

Sand for a Water Filter. Method of preparing it for New Haven filters. Abstract from paper before Connecticut Society of Civil Engineers, by Chas. A. Ferry. 1 3-4 pp. Municipal Journal and Engineer, March 13. Fire and Water, March 23.

Water Analysis.—Use of Lactose Bile Media in, for determination of B. coli. Abstract of paper before American Public Health Association, by Daniel D. Jackson. 1-2 p. Engineering News, March 14.

Biology of Potable Waters. Full discussion (continued). Ad. Kenna. 3 1-2 pp. La Technique Sanitaire, March.

Pollution of Streams and Estuaries.—Editorial discussion. 1 1-4 pp. Water, March 15.

Pollution by Coal Waste of Philadelphia Supply. Report of commission showing serious pollution. 1 1-2 pp. Engineering News, March 21.

Subsoil Water.—Its use in India for drinking water. A. Willan Dawson. 1 3-4 pp. Water, March 15.

Underground Water Rights in England. Editorial discussion of recent decisions. 3-4 p. The Surveyor, March 18.

State Control of Water Supplies.—Editorial discussion of Pennsylvania and New Jersey conditions. 1-2 p. Engineering Record, March 16.

New York Water Supply Commission. Report for 1906 discussed. 3-4 p. Engineering News, March 14.

Waterworks of New York State. Data concerning number of private and municipal plants and cost of construction; meter and hydrant rates, etc. From report of Water Commission. 1 p. Municipal Journal and Engineer, March 13.

Pennsylvania Water Supply Commission. Description of the work which it is doing. 1 3-4 pp. Engineering Record, March 16.

Water Survey of Illinois. Discussion of annual report. 1-3 p. Engineering News, March 21.

Reservoirs for Small Water Supplies.—Paper before Association of Engineers-in-Charge, by H. C. H. Shenton. Illustrated. 1-2 p. Local Government Journal, March 16.

Cobb's Hill Reservoir, Rochester. Abstract of the specifications for construction; description of work already done. Illustrated. 2 1-2 pp. Engineering Record, March 2.

Water Tanks of Reinforced Brickwork.—Some early examples of these in English colonies. James Stewart. 4 pp. Concrete, March.

Concrete Standpipe at Attleboro, Mass. Illustrated. Geo. H. Snell. 1 3-4 pp. Fire and Water, March 16.

Riveted Steel Pipe.—Line of 48" at Kansas City. Description of construction. Illustrated. C. K. Allen, 1 1-2 pp. Engineering Record, March 2.

Leaks in Riveted Steel Conduits.—Method of stopping pit holes in Rochester's conduit. 1-4 p. Engineering Record, March 16.

Tests of Tightness of Stop Cocks and Gate Valve. Inquiry concerning the tightness of water distribution systems. Illustrated. A. Chamboile. 3 1-2 pp. La Technique Sanitaire, March.

Electrolysis of Water Pipes.—Report of conditions in Providence, R. I., by A. A. Knudson. Illustrated. 2 pp. Water and Gas Review, March.

Water Tunnel, Seven-Foot, at Polk Street, Chicago.—Description of construction. Illustrated. 2 1-2 pp. Engineering Record, March 16.

Hydrant Rates in California.—Gives rates of a considerable number of cities. 1-4 p. Municipal Journal and Engineer, March 6.

Meter Registers, Protection Of.—Sealing legal status, etc. Paper before American Waterworks Association, by C. E. Loetzer. With discussion. 1 3-4 pp. Water and Gas Review, March.

Pumping Station, Growth of the.—Discussion of paper by Chas. A. Hague before American Waterworks Association. 2 pp. Water and Gas Review, March.

STREET LIGHTING AND ELECTRIC POWER

Gas Lighting.—Cost, utility and future of gas. Argument that monopoly and graft retard growth and keep up the price. 6 pp. Chas. H. Cochrane. Moody's Magazine, March.

Magnitude of the Gas Industry. A few statistics. 3-4 p. Light, March.

Electrolysis of Gas Mains.—Review of present knowledge of the subject. Paper before American Gas Institute by M. R. Bump. 1 3-4 pp. American Gas Light Journal, March 18.

Electrolysis. Alternating current; also of iron and steel in concrete. Abstracts of papers before American Institute of Electrical Engineers, by J. L. R. Hayden and A. A. Knudson. With discussion. 3 pp. Electrical Review, March 16.

Electric Lighting.—A retrospect and prophecy. W. W. Freeman. 1 p. Electrical Review, March 9.

Photometry of Incandescent Gas Lamps. Paper before Illuminating Engineering Society by Thos. J. Little, Jr. With discussion. 8 1-2 pp. Illuminating Engineer, February.

New Incandescent Lamps. Paper before Institution of Electrical Engineers, by J. Swinburne. Illustrated. 6 pp. Illuminating Engineer, February.

Standard Specifications for Incandescent Lamps. By an English committee, giving standard methods of rating. 2 pp. Illuminating Engineering, February.

Drop in Alternating Current Lines.—Theoretical discussion. Ralph D. Meshon. 15 pp. Specific examples. Clarence P. Fowler. 4 pp. Electrical Journal, March.

Gas and Electric Service.—Statement of service and finances of municipal plant at Holyoke, Mass. 1-2 p. Municipal Journal and Engineer, March 20.

Light and Illumination.—Semi-technical paper before Illuminating Engineering Society, by Chas. P. Steinmetz (continued). 2 pp. American Gas Light Journal, March 18, 3 pp. March 25. Progressive Age, March 15.

Uniform System of Records and Accounts.—Necessity of this in gas business emphasized by compulsory publication. Paper before New England Association of Gas Engineers, by Alexander C. Humphreys (continued). 3 3-4 pp. American Gas Light Journal, March 11; 3 pp. March 18; discussion, 3 1-2 pp. March 25. Water and Gas Review, March. 10 pp. Light, March. Progressive Age, March 1; discussion, March 15.

Candle-Power Dispute.—Discussion of indefiniteness of present terms; special reference to Colorado Springs. 2-3 p. Engineering Record, March 16.

"Lighting the Village and Its Houses."—By Arthur N. French. 3 1-2 pp. The Village, March.

Municipal Electric Works of Gravesend, England.—Description, including recent extensions. Illustrated. 2 1-2 pp. Contract Journal, March 13.

Single-Phase vs. Three-Phase Power Transmission.—Abstract from Journal of Electricity, Power and Gas. 1-2 p. Electrical Review, March 23.

FIRE AND POLICE

Fire Service, History of American.—Address before Connecticut State Firemen's Association, by Chief Hopkins of Somerville, Mass. 2 1-2 pp. Fireman's Herald, March 2.

Two-Platoon System for Firemen.—Arguments favoring this. Frederick H. Cowles. 1 p. Fireman's Herald, March 9.

Two-Platoon System. Report of Dayton, O., Board of Public Safety. 1-4 p. Fireman's Herald, March 16.

Two-Platoon System. Reasons why firemen should oppose this for their own welfare. 1 3-4 pp. Fireman's Herald, March 23.

Moving-Picture Exhibits and Fire Hazard.—Discussion of dangers connected with such exhibits. 1-3 p. Electrical Review, March 23.

Bingham Bill.—Description of bill for reorganizing police force of New York City. 1-2 p. Municipal Journal and Engineer, March 20.

Proposed Changes in New York Police System: "Our Masters, the Police." Editorial. 3-4 p. The Outlook, March 16.

GOVERNMENT AND FINANCE

Government by Commission.—Kansas State law empowering cities to adopt this form of government discussed. Sheffield Cowdrick. 1 1-2 pp. Municipal Journal and Engineer, March 20.

Galveston's City Government. Description of her present system, by Mayor Landis. 3 pp. Bulletin, League of American Municipalities, February.

Referendum. Assertion of the People's Right to.—By Graham Taylor. 1 1-2 pp. Charities, March 2.

"Initiative and Referendum." Notes by Ralph Albertson. 7 pp. The Arena, March.

Municipal Ownership.—View of the owner of a private street lighting plant. 4 pp. Bulletin, League of American Municipalities, February.

Blight of Municipal Ownership. Editorial. 1-2 p. Electrical Review, March 2.

Municipal Ownership in Edmonton, a city which owns all the franchises. Mayor Griesbach. 2 pp. Canadian Municipal Journal, March.

Municipal Ownership. Opinions of mayors of nine Southern cities. 1 3-4 pp. The Tradesman, March 1.

Public and Private Ownership. Arguments in favor of private ownership. John W. Hill. 1-2 p. Fire and Water, March 9.

Municipal Ownership: "Public Ownership of Public Utilities." Notes by Prof. Frank Parsons, Ph.D. 2 pp. The Arena, March.

Municipal Trading: "Municipal Glasgow." By Benjamin Taylor. 14 pp. North American Review, March 15.

Municipalization and Labor Problems. Relation between the two. Editorial. 1-2 p. Municipal Journal and Engineer, March 13.

Municipal Ownership in London. Comment on recent election. 1-2 p. Progressive Age, March 15.

"Municipal Reaction in London." The County Council election. Editorial. 1 1-2 pp. The Outlook, March 16. 1-2 p. Harper's Weekly, March 23.

Anti-Corporation Campaign.—Mayorality candidacy of George Stewart Brown in Baltimore. By Day Allen Willey. 3 1-2 pp. Illustrated. The Independent, March 14.

"Social Legislation for Washington." Editorial. 1-2 p. Charities, March 16.

"Land Tax, German Experiments with the."—By William C. Dreher. 3 1-2 pp. Review of Reviews, March.

Municipal Fire Insurance.—Discussion of London's experience; also of a semi-municipal scheme. 1-2 p. Local Government Journal, March 2.

Taxation of Intangible Assets.—Provisions of Texas law; separate tribunal needed for equitable equalization. W. R. Davie. 6 1-2 pp. Moody's Magazine, March.

Municipal Bond Market.—Opinions of financiers concerning same. 1-4 p. Municipal Journal and Engineer, March 27.

Municipal Bond Market Conditions. 1-2 p. American Banker, March 2.

Municipal Bond Market. Opinions of various bond houses concerning its present and future. 1 p. American Banker, March 16.

Municipal Bond Market. Editorial discussion. 1-2 p. The Financier, March 25.

Bond Sales During January of Municipal Bonds. Table giving financial standing of cities also. 1-4 p. Municipal Journal and Engineer, March 13.

REFUSE COLLECTION AND DISPOSAL

Waste Disposal for East Orange.—Abstract of report recommending plant, by Henry Floy. Amount and analysis of garbage and refuse. Illustrated. 2 1-4 pp. Municipal Journal and Engineer, March 27.

Disposal of Municipal Waste. Table of all American garbage furnaces since 1884. Reasons for failures. Advice to municipalities. W. F. Morse. 3 3-4 pp. Municipal Journal and Engineer, Mar. 6.

Incineration of Waste by Destructors. Brief description of Heenan & Froude destructors. 1-2 p. *La Technique Sanitaire*, March.

Snow Removal in Brussels. Methods and cost. A. Smeyers. 2 pp. *La Technique Sanitaire*, March.

PARKS AND CITY BEAUTY

Planning Towns and Cities. Prof. Baumeister's report to Incorporated Society of Architects and Engineers (Germany), treating of extensions, streets, squares, buildings, etc. 2 1-2 pp. *Municipal Journal and Engineer*, March 6.

Plan for Extension of Lausanne. Rules governing extensions, alignment, height, sanitation, etc. H. Jacottet. 3 1-2 pp. *La Technique Sanitaire*, March.

City Plan for Toronto. Discussion of plan for Guild of Civic Art. Illustrated. W. Ford Howland. 2 pp. *Canadian Municipal Journal*, March.

Site Planning for Model Cottages. An English prize plan. Illustrated. 1-2 p. *Contract Journal*, February 27.

Municipal Art.—Civic Center for Springfield, Mass. 1 3-4 pp. Illustrated. Notes and comments department, *Architectural Record*, March.

Civic Beauty at Northampton, Mass. Shade trees, civic center, etc. Illustrated. Edw. T. Hartman 3 pp. *Park and Cemetery*, March.

Suggested Municipal Improvements in Boston. Editorial. 1 1-2 pp. *American Architect*, March 2.

Civic Improvement. Notes on what various cities are doing towards beautifying. 2 pp. *Charities and The Commons*, March 16.

Making the City Beautiful. Abstracts from recent newspapers on the subject. 1-2 p. *Manufacturers' Record*, March 21.

"City Beautifying." Reports on. 1-4 p. Civic Improvement department, *Charities*, March 16.

"Report of New York's Art Commission." 1-2 p. Civic Improvement department, *Charities*, March 16.

Park Work in Denver.—Statement of present system and recent work. Illustrated. 1 1-2 pp. *Park and Cemetery*, March.

"Playground Legislation in Washington." Editorial. 2 pp. *Charities*, March 2.

Playground in Philadelphia. Plan for a New, with swings, sand piles, baseball, etc. Illustrated. 1-2 p. *Park and Cemetery*, March.

Bill to put Boston playgrounds in control of School Department: "Massachusetts Playgrounds." Editorial. 1-2 p. *Charities*, March 23.

Shade Trees.—Striking effects at Rochester and Los Angeles with poplars and palms. Illustrated. 1-2 p. *Park and Cemetery*, March.

Disease of Chestnut Trees. A fungus which is destroying many trees in New York and vicinity. Illustrated. 1 1-2 pp. *Park and Cemetery*, March.

Rose Culture in Public Parks. Instructions for growing and usefulness of public rose gardens. Illustrated. Theodore Wirth. 5 1-2 pp. *Park and Cemetery*, March.

"Oiled Roads in Boston Parks. Experiments with."—By J. A. Pettigrew, Superintendent of Parks. 1-2 p. *Park and Cemetery*, March.

TRAFFIC AND TRANSPORTATION

Street Railways.—"The Municipal Ownership of Street Railways in Ger-

many." By Edward R. Heyn. 4 1-2 pp. *Review of Reviews*, March.

"The Needless Slaughter by Street Cars." By John P. Fox. 9 pp. Illustrated. *Everybody's Magazine*, March.

"Settling Chicago's Traction Question." Editorial. 1 p. *The Outlook*, March 9.

Chicago Traction Ordinances. Approval by voters urged by Republican convention. 1 p. *Electric Railway Review*, March 9.

Rapid Transit Systems of London.—Technical description of the present condition of these. Illustrated. 6 pp. *Engineering News*, March 21.

Philadelphia's Elevated Railway. Description of the new Market street elevated and subway road. Illustrated. 4 pp. *Electric Railway Review*, March 9.

Railroad Crossing Improvements in New Haven.—Abstract of papers before Connecticut Society of Civil Engineers, by John F. Trumbull and C. L. Slocum. Illustrated. 2 pp. *Municipal Journal and Engineer*, March 13.

Track Elevation in Cleveland. Description of work done by P. R. R. Illustrated. 1 p. *Engineering Record*, March 16.

Lowering Tunnels Under the Chicago River. Lowering brick-built tunnels to permit deepening the river. Illustrated. 2 pp. *William Artingstall*. *Engineering News*, March 7.

Subway for San Francisco.—Proposal to construct subway in Market street by raising street level. Illustrated. W. G. Hopkins. 1 3-4 pp. *Architects and Builders' Journal*, March.

Power Station of P. R. R. Tunnel in Long Island City.—Description of building and machinery. Illustrated. 8 pp. *The Engineer*, March 15.

Steam Omnibus for Street Service in London.—Technical description of a steam motor car. Illustrated. 2 pp. *Engineering News*, March 7.

Municipal Electric Tramways, Erdington, England.—History and description. Illustrated. 3 1-2 pp. *Contract Journal*, March 13.

Perpetual Franchises, Validity of.—Discussion of U. S. Circuit Court decision re. Des Moines City Railway Co. 1-2 p. *Electric Railway Review*, March 9.

MISCELLANEOUS

Building Regulations.—Discussion of building heights in Springfield, Mass. 1 3-4 pp. Illustrated. Notes and comments department, *Architectural Record*, March.

"Building Difficulties in San Francisco." Editorial. 1 p. *Charities*, March 2.

Building Code Revision. Discussion of New York's, and building codes generally. 1 1-4 p. *Engineering News*, March 14.

Building Regulations in London. Description of these (concluded). 1 p. *Contract Journal*, February 27.

Housing.—Model Tenements in St. Petersburg. Review of article from *Berlin Tag*. 1 1-2 pp. Illustrated. *Review of Reviews*, March.

Slum Conditions.—"The Growth of the Slum in Our Cities." By Elinor H. Stoy. 4 1-2 pp. *The Arena*, March.

"Workingmen's Gardens in France."—By William H. Tolman. 8 pp. Illustrated. *The Century*, March.

Garden City Movement. Description of a project for building in English cities and suburbs model workmen's cottages. John H. Whitehouse. 8 1-2 pp. *The Chautauquan*, March.

Markets and Abattoirs.—Sanitary Features of. IV. in series of articles. By William Paul Gerhard. 3 1-2 pp. Illustrated. *American Architect*, Feb. 23.

Public Slaughter House at Newport, England. Plan and description. Illustrated. 1 p. *Local Government Officer*, March 2.

"New York Real Estate vs. Wall Street."—Growth and Wealth of New York. By Francis H. Sisson. 5 1-2 pp. *Moody's Magazine*, March.

Steam Heating.—Carrying capacity of pipes for low pressure. Technical article, with tables. William Kent. 4 pp. *Engineering Review*, March.

Pipe Subways in British Cities and in Paris. Description in detail of subways in seven cities. Illustrated. 4 pp. *Engineering News*, March 14.

Smoke Prevention in Cleveland.—Report of success in that city. 1-3 p. *Municipal Journal and Engineer*, March 6.

Anti-Smoke Ordinance of Atlantic City. Text and comment. 1-2 p. *Municipal Journal and Engineer*, March 20.

Civic Societies.—A hint as to desirable work to be done. Editorial. 1-2 p. *Municipal Journal and Engineer*, March 20.

Civic Improvement. Various Notes of Progress. Notes and comments department, *Architectural Record*, March. Various notes on, 2 pp. *Park and Cemetery*, March. Various notes on, 2 pp. *Charities*, March 16.

Work of Framingham (Mass.) Association: "Village Improvement." By Frederic A. Whiting. 5 pp. Illustrated. *The Village*, March.

An Improvement Society's Memorial. the Sedgwick Memorial at Stockbridge, Mass. 1 p. Illustrated. *Park and Cemetery*, March.

"Civic Art and Civic Nuisances." Editorial. 1 p. *The Century*, March.

The Billboard Crusade. New notes on. 1 p. *Park and Cemetery*, March.

Constructing Utilities in Small Towns. More expert advice needed. 1-4 p. *Manufacturers' Record*, February 28.

Trench Excavator.—Description of an English machine. Illustrated. 1 1-2 pp. *Water*, February 15.

Rope Transmission in Reservoir Construction at Longridge, England. Illustrated. 3 pp. *Water*, March 15.

Coal Storage and Conveying Systems.—Description of plants, including that at Berlin municipal electric station. Illustrated. Franz Koester. 6 pp. *Power*, April.

Concrete Bridges in Iowa. Cost and detailed construction methods of a number built by day labor. Paper before Iowa Association of Cement Users, by Henry Haag. 5 pp. *Iowa Engineer*, January.

Concrete Bridge in Scotland. Description of six 61-foot spans. Illustrated. 1 p. *Concrete*, March.

Concrete-Steel Bridge. Fifteen 60-foot arches across Hudson river at Sandy Hill, N. Y. Description. Illustrated. 3 pp. *Cement*, March.

Forms for Concrete Construction.—For sewers, conduits, buildings, etc. Paper before National Association of Cement Users, by Sanford E. Thompson. Illustrated. 2 1-2 pp. *Rock Products*, February 22.

Steel in Concrete Corroded by Electrolytic Corrosion.—Paper before American Institute of Electrical Engineers describing results of experiments on this. Illustrated. 15 pp. A. A. Knudson. *Proceedings American Institute of Electrical Engineers*, February.

Chaining Method and Apparatus.—Novel ideas in topographical survey of Brooklyn for establishing monuments. Illustrated. George J. Falkinburg. 1 p. Engineering News, March 14.

Franchise, Value of a Short Term.—Effect of depreciation and amortization on returns from investments under such. 1 1-4 pp. Electric Railway Review, March 9.

Descriptions of Cities and Towns.—Portland, Me.: "The Longfellow Town." By Stephen Cammett. 10 pp. Illustrated. Putnam's Monthly, March.

Charleston Gardens. By Frances Duncan. 12 pp. Illustrated. The Century, March.

Northampton, Mass. By Edward T. Hartman. 3 pp. Illustrated. Park and Cemetery, March.

Oakland, Cal.: "Oakland's Awakening." By Adna A. Denison. 12 pp. Illustrated. Sunset Magazine, March.

Savannah. An account especially of Georgian and Greek—Revival architecture in. By J. Robie Kennedy, Jr. 13 pp. Illustrated. Architectural Record, March.

"Goldfield, Nev., the New El Dorado." By A. E. Thomas. 15 pp. Illustrated. Putnam's Monthly, March.

Boston and Washington: "The Cities at Easter." By Walter Prichard Eaton. 2 pp. Illustrated. The Travel Magazine, March.

"Beautiful White Plains, N. Y." 3 pp. Illustrated. The Village, March.

"The Town of Proctor, Vt." By W. S. Allen. 4 pp. The Village, March.

Madison, Ind.: "A Small Indiana City." By B. G. Garber. 2 pp. Illustrated. The Village, March.

Washington, D. C. An enthusiastic description of the city and its Government. Illustrated. J. Horace McFarland. 12 1-2 pp. The Outlook, March 23.

Pittsburg, Pa. Popular description. Illustrated. 4 1-2 pp. Good Roads Magazine, March.

Chicago—Its Immorality and Vice. An attempt at a definite statement of conditions there. George Kibbe Turner. 17 pp. McClure's Magazine, April.

the subject of reinforced concrete, general principles of reinforcing metals, the disposition of concrete and the mechanical bond are dealt with. Going into more detail, styles of slab and beam reinforcement are taken up and the general phenomena of flexure are gone into. The various theories of beams as well as the theory of columns and foundations are treated at length. Many examples of building construction are described and illustrated in detail and some good, practical suggestions are made. The chapters on retaining walls, dams, conduits and sewers and tank and reservoir construction will especially interest the municipal engineer. Bridge work is gone into in considerable detail, separate chapters being devoted to arches, floors and abutments. A final chapter is occupied with the question of cement blocks.

Electrical Wiring and Construction Tables. Henry C. Horstmann and Victor H. Tousley. Flexible leather. Pocket size. Price, \$1.00. F. J. Drake & Co., Publishers, Chicago.—This book is written as a handbook for the wireman, foreman, contractor, engineer or architect and contains such information as he may require at a moment's notice. The seven chapters deal respectively with problems of: Direct Current Wiring. Alternating Current Wiring. Economy of Conductors. Miscellaneous Data. Calculation of Materials. Conduits and Wires. Tables of Carrying Capacities.

The Manufacture and Properties of Iron and Steel.—By Harry Huse Campbell. Fourth Edition. New York: Hill Publishing Co., 1907. 640 pp., 6x9 inches. The author is the metallurgical engineer for the Pennsylvania Steel Co., the Maryland Steel Co. and the Spanish-American Iron Co. The book is written for engineers who wish a brief statement of the art of making steel as well as for others interested in problems of the metallurgic art. The author divides his book into three parts, although the first and the second parts cover the same ground, part one being a brief statement of the main principles of iron metallurgy written so as to be clear to the reader with little technical knowledge. These introductory statements serve to make clear the more detailed description which follows in part two about the different iron and steel making processes. Separate chapters are accordingly given to these subjects: The Blast Furnace, Wrought Iron, High Carbon Steel, the Acid Bessemer Process, the Basic Bessemer Process, the Open Hearth Furnace, the Acid Open Hearth Process, the Basic Open Hearth Process. The properties of iron and steel are discussed under the subjects of Segregation and Homogeneity, Influence of Heat, Working on Steel, Heat Treatment, History and Shape of the Test-Piece, the Influence of Certain Elements on the Physical Properties of Steel, Classification of Structural Steel, Welding and Steel Castings. Part third is devoted to the history and statistics of the industry in the United States, Great Britain, Germany, France, Russia, Austria and other countries. While the standard specifications have been omitted from this book, as they are constantly subject to change, the author frequently refers to points in specifications and one of his principal objects is to have

the reader look at the question of specifications and requirements of steel from the point of view of the practical steel maker.

The Disinfectant Value of Chlorine.—A reprint in the form of a booklet of a series of articles on the application of chlorine to disinfecting purposes, with tests of efficiency and a glossary of technical terms. The leading article is a translation of a paper by Dr. Schumacher—which appeared first in the Public Health Engineer. In addition details are given of the application of chlorine to water mains and water supplies as well as to sewage. The use of chloros, a preparation containing 120 grammes per liter of available chlorine is advocated in a paper by Dr. E. Klein.

MUNICIPAL REPORTS

Water Department of the City of Harrisburg, Pa.—Nineteenth Annual Report of the Board of Commissioners for the year 1906. This is a notable report, covering as it does the first year's operation of the filter plant as well as an extension of the use of meters on manufacturing plants. Statistics for the year are presented in a summary in the form recommended by the New England Water Works Association. Harrisburg, with a population of 50,000, is supplied with water from the Susquehanna river, which is filtered, pumped to a reservoir, and distributed through seventy-eight miles of mains. The pumps, of the Barr type, were supplied with steam from boilers burning anthracite rice coal costing \$1.25 per ton. The amount burned during the year was 11,994,854 pounds, and the gallons of water pumped against an average dynamic head of 235 feet were 3,803,869,700, an average of 321 gallons per pound of coal. The pumping expenses were \$5.33 per million gallons. The receipts from fixture rates were \$34,340, domestic meter rates \$76,982, manufacturing meter rates \$63,561—other items bringing the total up to \$182,271. The expenditures were, for operation, including management and repairs, \$61,474, and special, \$14,405, making a total maintenance of \$75,880; interest on bonds was \$34,552, and sinking fund \$40,632. The construction account was \$182,271. The net cost of works to date is \$1,250,000 and the bonded debt \$921,600. The percentage of water metered was 66 and the average daily consumption 10,421,560, making the gallons per day per inhabitant for manufacturing purposes 81, and for domestic use 68, a total of 149. The cost of supplying water per million gallons, figured on total maintenance, was \$19.56, and with interest included, \$29.03.

Annual Report of the City Engineer and Water Works Committee of the City of Ottawa for the year 1905.—City Engineer Newton J. Ker presents a very complete account of the engineering operations of the city in a well arranged volume of 110 pages. Under the caption of "Cement Curb and Gutter," in the January 16 number of the Municipal Journal and Engineer, some of the work of the department is described.

Reports to the Water Committee of Pittsfield, Mass.—By A. A. Forbes, Engineer of the Board of Public Works, and E. A. Ellsworth, Consulting Engineer. This report is largely taken up with a discussion of the insufficiency

BOOK REVIEWS

Concrete and Reinforced Concrete Construction.—By Homer A. Reid. New York: The Myron C. Clark Publishing Company, 1907. 884 pages, 6x9 inches. Price, \$5. The author, Homer A. Reid, is Assistant Engineer in the Bureau of Buildings, New York City, and as such has had an extensive experience with concrete work, more especially in the field of reinforced concrete building construction. The book is written as a reference book for engineers, architects and contractors who may desire concise and reliable information, and the author also believes it may interest the engineering student. The book begins with a brief history of the early use of cement. The different kinds of cement now manufactured and the properties and methods of testing are described. A discussion of the ingredients of the aggregate, proportioning, methods of mixing and placing concrete is concluded by instructions for estimating cost. Other general considerations, such as methods of finishing surfaces, and an account of the physical properties, such as elasticity, close the subject of simple concrete. Coming to

of the present water supply and detailed plans for a new supply.

Controller's Fifteenth Annual Report, McKeesport, Pa.—For the year ended April 2, 1906. Controller C. E. Soles' report covers an expenditure of \$324,766.47, divided into twenty-four accounts, for a city of 45,000 population, having an assessed valuation of \$20,069,500 and an actual valuation of \$40,000,000. At the end of the report are interesting tables showing receipts for the past twelve years from main sources of revenue and expenditures for the leading appropriations for the same period.

City Auditor, Providence, R. I.—Sixteenth Annual Report for the year ended September 30, 1906. The year's report of Auditor Philip S. Chase covers an expenditure of \$5,005,928 for ordinary and \$2,546,004 for extraordinary expenditures. The gross debt of the city was \$18,176,176. A detailed list of city real estate is given, the total of which was \$14,224,800. The real and personal property, including sinking fund, amount to \$20,042,257.

Joplin, Jasper County, Missouri.—The Commercial Club of Joplin publishes a handsomely illustrated folio of about a hundred pages reviewing the metropolis of southwest Missouri and the famous zinc and lead country. It sets forth the opportunities offered to the homeseeker, investor and capitalist; it describes the great mining, manufacturing, agricultural and climatic advantages and resources of the region.

Report of the Board of Railroad Commissioners of the State of New York.—Statistics in the matter of the Transportation Problem in Greater New York and a Comparative Statement of Operation of Surface, Elevated and Subway Lines for the Quarter Ending September 30, 1905 and 1906. The report shows a total of 324,681,124 cash fares collected in the quarter of 1906, an increase of 22,345,614 over the corresponding quarter of 1905. The total car mileage was 63,494,354, an increase of 1,979,308 over the corresponding quarter in 1905.

Ohio State Board of Health, 20th Annual Report. Year ended December 31, 1905. There was no change in the personnel of the Board since the last report, Dr. C. O. Probst being the Secretary. It is noticed that the small-pox epidemic, as predicted, practically came to an end. Public appreciation of the work of the Board in looking after matters of water supply and sewerage are becoming evident, and it is stated that when all of the works that have been approved are installed Ohio will have a larger per cent. of its population supplied with filtered water than any other State. During the year considerable attention has been given to the exclusion of trade wastes from the water supplies. Water purification works were approved for nine cities and sewage purification for six. The bulk of the report consists of detailed reports and tests.

Tests of Incandescent Lamps.—Being Bulletin No. 4, February, 1907, Iowa State College Engineering Experiment Station, Ames, Iowa, by L. B. Spinney. The subject matter of the bulletin is prefaced by a general discussion on the subject of lamp testing. Tabulated tests are given which lead to the conclusions that: there is a wide variation in incandescent lamps in selection, in actual candle power, in actual

wattage in vacuum and in the ratio of mean spherical to mean horizontal candle power. About sixty-two per cent. of commercial sixteen candle power lamps are well selected. About seventy-six per cent. of commercial incandescent lamps are properly exhausted.

Glass and Clay Products.—Bulletin 62, Bureau of the Census. Census of Manufactures: 1905. In the section on Glass a comparative summary of the statistics of the industry according to States is presented. Pressed and blown glass and building glass are separately treated. A sketch of the history of American art glass is also given. In the section on clay, statistical summaries are presented, the cost and value of products being worked out. A historical and descriptive account of American art potteries is added.

NEWS OF THE SOCIETIES

American Society of Civil Engineers.

—The thirty-ninth annual convention of the society will be held in the City of Mexico, beginning July 8. Three weeks will probably be taken up with meetings and trips to points of interest. The decision of the board to hold the convention in the City of Mexico is due largely to a special invitation received from President Diaz, who is also President of the Mexican Society of Engineers. Practically free transportation has been promised from the United States border not only to the City of Mexico, but also for such excursions as may be desired. The committee of arrangements consists of A. L. Bowman, J. Waldo Smith and Charles Warren Hunt. At the regular meeting on April 17 a paper will be presented by William B. Fuller and Sanford E. Thompson on "The Laws of Proportioning Concrete."

American Society of Mechanical Engineers.—At the regular monthly meeting held in the auditorium of the Engineering Societies Building, 33 West Thirty-ninth street, New York City, on March 21, President Frederic R. Hutton announced that he had received a check for \$50,000, payable to the American Institute of Electrical Engineers, a donation from the Westinghouse Electric and Manufacturing Company towards the mortgage on the home of the societies.

Association of American Cement Manufacturers.—At the quarterly meeting to be held at the Bellevue-Stratford Hotel, Philadelphia, Pa., a paper on "Concrete Bridges" will be read by George S. Webster; a paper on "Cement Concrete Roads," by Walter S. Hassam, and a paper on "Concrete Street Pavements," by H. L. Weber.

International Association for the Prevention of Smoke.—The programme for the second annual convention has been issued. It announces that the gathering will be held in Milwaukee June 26, 27 and 28. Charles Poetke, City Inspector of Smoke, is in charge of arrangements. The sessions will be held in the City Hall. Mayor Becker will welcome the guests and John Fairgrieve, of Detroit, president of the association, will respond. R. C. Harris, of Toronto, will also answer the address of welcome, he being the secretary and treasurer. Among the papers which will be read is one by William J. Zimmers, an attorney of Milwaukee, who will discuss the subject, "The Public Right to Pure Air." An elaborate entertainment is being arranged for the ladies who will accompany the anti-smoke men.

Calendar of Meetings

- April 9-10. Association of American Cement Manufacturers.—Quarterly meeting, Bellevue-Stratford Hotel, Philadelphia, Pa.—J. B. Lober, President, Land Title Building, Philadelphia, Pa.
- April 12. Western Society of Civil Engineers.—Regular meeting.—J. H. Warden, Secretary, 1737 Monadnock Block, Chicago, Ill.
- April 17. American Society of Civil Engineers.—Regular meeting, House of the Society, 220 West Fifty-seventh street, New York City.—Charles Warren Hunt, Secretary.
- April 18-21. Southwestern Gas, Electric and Street Railway Association.—Annual meeting, San Antonio, Tex.—Frank C. Duffey, Secretary, Beaumont, Tex.
- April 26. Jamestown Tercentennial Exposition, Norfolk, Va., April 26 to November 30.
- May 8-10. Texas State Firemen's Association.—Convention, McKinney, Tex.—W. M. Abernathy, Mayor, Chairman, Committee on Entertainment.
- May 22-24. National Fire Protection Association.—Annual meeting, New York City.—W. H. Merrill, Secretary, 382 Ohio street, Chicago, Ill.
- May 28-30. American Society of Mechanical Engineers.—Spring meeting, Indianapolis, Ind.—Calvin W. Rice, Secretary, 12 West Twenty-first street, New York.
- June 1-4. American Anti-Tuberculosis League.—Annual convention, Atlantic City, N. J.—Dr. George Brown, Atlanta, Ga., President; Dr. Edward Guion, 1408 Atlantic avenue, Atlantic City, N. J., Vice-President.
- June 4-7. National Electric Light Association.—Annual meeting, Washington, D. C.
- June 11-15. American Water Works Association.—Twenty-seventh annual convention, Toronto, Ontario, Canada.—Dabney H. Maury, President; J. M. Diven, Charleston, S. C., Secretary.
- June 12. National Conference of Charities and Correction.—Thirty-third Conference, Minneapolis, Minn.
- June 18. International Association of Chiefs of Police.—Annual convention, Auditorium, Jamestown Exposition Grounds.—Major Richard Sylvester, President, Washington, D. C.
- June 18-20. Municipal League of Indiana.—Meeting, Logansport, Ind.—Councilman J. T. McNary, Chairman, Local Committee, Logansport.
- June 20-22. The Playground Association of America.—First Annual meeting, Chicago, Ill.—Dr. H. S. Curtis, Secretary.
- June 24. American Institute of Electrical Engineers.—Annual meeting, Niagara Falls, N. Y.—Ralph W. Pope, Secretary, 29 West 39th street, New York City.
- June 26-28. International Association for the Prevention of Smoke.—Second annual convention, Milwaukee, Wis.—Charles Poetke, Smoke Inspector, Milwaukee, Wis.
- July 8. American Society of Civil Engineers.—Annual convention, Mexico City.—Charles Warren Hunt, Secretary, 220 West 57th street, New York City.
- August 6-8. American Association of Park Superintendents.—Annual convention, Toronto, Ont.—F. L. Mulford, Secretary, Harrisburg, Pa.
- August 20-22. The International Association of Municipal Electricians.—Annual convention, Jamestown Exposition, Norfolk, Va.—F. F. Foster, Secretary, Corning, N. Y.
- August 20-23. New York State Firemen's Association.—Convention, Elmira, N. Y.
- September 19-21. League of American Municipalities.—Annual convention, Jamestown Exposition.—John MacVicar, Secretary, Des Moines, Ill.
- October 8-11. International Association of Fire Engineers.—Thirty-fifth Annual Convention, Washington, D. C.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Buildings, Bridges and Street Railways—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards

BIDS ASKED FOR

| STATE | CITY | RECEIVED UNTIL | NATURE OF WORK | ADDRESS INQUIRIES TO |
|----------------------------|-------------------|-----------------------|--|---|
| Street Improvements | | | | |
| Iowa..... | Des Moines..... | April 4, 11 A.M..... | Laying 1,010 sq. yds. brick in alley; also 5,679 ft. Portland cement curb, 3 sts..... | W. W. Wise, Bd. Pub. Works. |
| New York..... | New York..... | April 4, 11 A.M..... | Paving with asphalt blocks; 4 contracts..... | Louis F. Haffen, Pres. Bronx Boro. |
| Indiana..... | Sullivan..... | April 4, noon..... | Constructing 18 miles stone roads, 5 twps..... | E. E. Russell, Co. Auditor. |
| Ohio..... | Cincinnati..... | April 4..... | Grading, granite paving, curb, etc., Edway; also McMillen St., wood block..... | M. J. Keefe, Clerk, Bd. Pub. Serv. |
| New York..... | Buffalo..... | April 5, 11 A.M..... | Repaving Amherst St. and South Park Ave..... | F. G. Ward, Com'r Public Works. |
| Michigan..... | Grand Rapids..... | April 5, 2 P.M..... | Paving 3 sts. with brick..... | Samuel A. Freshney, Sec'y B. P. W. |
| Indiana..... | Vincennes..... | April 5, 2 P.M..... | Constructing 22,838 ft. gravel road..... | John T. Scott, County Auditor. |
| District of Columbia..... | Washington..... | April 6, noon..... | Laying cement walks, Conn. Ave. bridge..... | H. B. F. Macfarland, Commissioner. |
| Wisconsin..... | Marinette..... | April 6, 2 P.M..... | Paving 3 sts. brick; one, macadam..... | Jacob Wittig, Chm. B. P. W. |
| Indiana..... | New Albany..... | April 6..... | Paving Market St., vitrified brick..... | Sam. T. Mann, City Engineer. |
| Wisconsin..... | Oshkosh..... | April 6..... | Paving, grading and curbing certain sts..... | Otto C. Laabs, City Clerk. |
| Ohio..... | Cincinnati..... | April 8, noon..... | Brick paving, sandstone curb, 2 sts., cost, \$14,690..... | M. J. Keefe, Clk. Bd. Pub. Serv. |
| Louisiana..... | New Orleans..... | April 8, 1 P.M..... | Repaving Carondelet St., asphalt or bitulithic; also drains, curbs, gutters, walks, etc..... | Chas. R. Kennedy, City Comptroller. |
| New York..... | Binghamton..... | April 8, 8 P.M..... | Repaving 35,778 sq. yds. brick, 6-in. concrete, 5,955 cu. yds., and excavation 10,780 cu. yds., 4 sts.; also 2 bridges with wood block on concrete..... | S. M. Baird, City Engineer. |
| Indiana..... | Lagrange..... | April 8..... | Paving Detroit St., brick on 2½ in. sand..... | N. L. Sweinhart, City Engineer. |
| Ohio..... | Cincinnati..... | April 9, noon..... | Brick paving, curb, drain, etc., Trade St..... | M. J. Keefe, Clk. Bd. Pub. Serv. |
| Illinois..... | Chicago..... | April 10, 11 A.M..... | Furnishing 25,000 sq. yds. cedar blocks..... | Wm. L. O'Connell, Com'r Pub. Wks. |
| Maryland..... | Baltimore..... | April 10, noon..... | Grading and macadamizing 3½ miles of road..... | W. W. Crosby, Ch. Engr. Md. Geol. Surv. |
| Maryland..... | Touson..... | April 11, noon..... | Grading and macadamizing 5 miles of road..... | Highways Commission. |
| Ohio..... | Cincinnati..... | April 12, noon..... | Repairing Montauk road..... | Fred Dreih, County Clerk. |
| Indiana..... | Terre Haute..... | April 13, 11 A.M..... | Constructing 2 roads, 12,662 ft. long..... | J. W. Denehie, County Auditor. |
| Ohio..... | Cleveland..... | April 13, 11 A.M..... | Grading, draining and paving Brecksville rd..... | A. B. Lea, County Engineer. |
| Ohio..... | Celina..... | April 13..... | Grading, gravel or macadam, etc., Will road..... | M. Lutz, County Engineer. |
| Ohio..... | Willoughby..... | April 15, noon..... | Grading, brick paving and curb, Erie St..... | C. C. Jenkins, Village Clerk. |
| Ohio..... | Cincinnati..... | April 15, noon..... | Paving 1,605 yds. brick, repaving 1,270 yds. boulders, 650 ft. limestone and 1,430 ft. sandstone curb; cost, \$4,119..... | M. J. Keefe, Clk. Bd. Pub. Serv. |
| Georgia..... | Atlanta..... | April 15, 3 P.M..... | Repaving 24,000 sq. yds. Edgewood ave. with creosote block, asphalt or bitulithic..... | R. M. Clayton, City Engineer. |
| Wisconsin..... | Green Bay..... | April 16, 10 A.M..... | Grading, macadam pavement, comb. curb and gutter E. Mason St..... | John G. Gross, Chm. Street Com. |
| Pennsylvania..... | Washington..... | April 16, noon..... | Constructing 12 miles, 2,240 ft. 9 roads..... | Wm. Wylie, Co. Road Engineer. |
| Ohio..... | Ravenna..... | April 16..... | Constructing State road, Portage County..... | Sam Huston, Columbus, Com'r. |
| Kentucky..... | Ashland..... | April 17..... | Laying 10,000 yds. brick on concrete and 19,000 ft. concrete curb and gutter..... | J. W. Bosley, City Engineer. |
| Ohio..... | Jefferson..... | April 17..... | Constructing State road, Ashtabula Co..... | Sam. Huston, Columbus, Com'r. |
| Pennsylvania..... | Erie..... | April 18, 8 P.M..... | Paving 8,210 yds. sheet asphalt or sheet block 3,900 yds. grading, 3,000 ft. curb, etc..... | B. E. Briggs, City Engineer. |
| Ohio..... | Sandusky..... | April 19..... | Grading and stoning 3,000 ft. of road..... | J. N. Traxler, Co. Auditor. |
| Ohio..... | Hillsboro..... | April 19..... | Constructing State road, Highland Co..... | Sam. Huston, Columbus, Com'r. |
| Oklahoma..... | Hobart..... | April 20..... | Twelve blocks of paving; also sewer; cost, \$17,000..... | O. E. Noble, City Engineer. |
| Minnesota..... | Duluth..... | April 20..... | Paving blocks, asphalt, tar macadam or creosoted block..... | Thomas F. McGilvray, City Eng. |
| Louisiana..... | Alexandria..... | May 7..... | Paving Fourth St. with asphalt..... | F. S. Hoyt, City Engineer. |
| Water Supply | | | | |
| Ohio..... | Cleveland..... | April 4, noon..... | Furnishing 320 4, 5, and 6-in. fire hydrants..... | A. R. Callow, Sec'y Bd. Pub. Serv. |
| Virginia..... | Richmond..... | April 4, 5 P.M..... | Furnishing meters and meter boxes..... | C. E. Bolling, Supt. Waterworks. |
| Virginia..... | Richmond..... | April 4, 5 P.M..... | Cutting and refilling pipe trenches and laying and relaying pavement..... | C. E. Bolling, Supt. Waterworks. |
| Pennsylvania..... | Austin..... | April 4, 8 P.M..... | Furnishing 300 tons c. i. pipe, 50 fire hydrants and valves, laying 4 miles 4, 6, 8-in. pipe, valves, etc., 2 gas engines, pumps, pumping station and concrete reservoir..... | J. F. Witmer, Buffalo, N. Y., Eng'r. |
| New York..... | Yonkers..... | April 4, 8 P.M..... | Constructing filtration plant; 2 covered masonry sand filters, and appurtenances..... | J. J. Devitt, Pres. Water Board. |
| Texas..... | Austin..... | April 4..... | Completing water system; inc. 300 tons pipe, 50 hydrants, 2 gas engines; power pumps, pumping station, concrete reservoir, etc..... | J. F. Witmer, Buffalo, N. Y. Eng'r. |
| Iowa..... | Solon..... | April 5..... | Extending 635 ft. of watermains..... | F. N. Meyers, City Clerk. |
| New Brunswick..... | Grand Falls..... | April 5..... | Furnishing c. i. pipe and specials..... | W. Fred Kerston, Town Clerk. |
| Minnesota..... | Wilmont..... | April 9..... | Constructing waterworks for village..... | J. J. Weitzel, Recorder. |
| New York..... | New York..... | April 10, 2 P.M..... | Sinking shallow and driving deep wells, 12 pumping stations; hauling and laying 48-in. main, and appurtenances, Fort Greene Park..... | John H. O'Brien, Com'r W. S. G. & E. |
| Oregon..... | Portland..... | April 10, 3 P.M..... | Furnishing 6,400 lengths 6-20-in. c. i. pipe, weight 2,650 tons, and 160,000 lbs. specials..... | Frank T. Dredge, Supt. Water Bd. |
| Georgia..... | Atlanta..... | April 10, 4 P.M..... | Furnishing approximately 30,450 ft. 3 to 36-in. c. i. pipe and fittings..... | Park Woodward, Gen. Man. Water Com'rs. |
| Georgia..... | Atlanta..... | April 10, 4 P.M..... | Building 4,000,000-gal. pressure filter plant, and fur. 30,450 ft. c. i. pipe 8-36-in. and specials..... | Park Woodward, Gen. Man. B. W. C. |
| Wisconsin..... | Bruce..... | April 10..... | Constructing waterworks; cost, \$8,000-\$10,000..... | Wm. Blackburn, Dep. City Clerk. |
| Montana..... | Billings..... | April 10..... | Constructing \$300,000 municipal waterworks..... | Henry Gerhartz, City Engineer. |
| Connecticut..... | New London..... | April 15, noon..... | Laying 11,350 ft. 20-in. and 5,150 ft. 24-in. trench, 550 ft. 24-in. pipe in tunnel; also specials..... | W. H. Richards, Water Eng'r. |
| Saskatchewan..... | Battleford..... | April 15..... | Constructing water works force main..... | R. C. Laurie, City Sec'y-Treas. |
| Ohio..... | Cincinnati..... | April 16, noon..... | Laying 12,750 ft. 16-20-in. c. i. pipe, etc..... | Elmer G. Prior, Clk. W. W. Com. |
| Pennsylvania..... | McKeesport..... | April 16, 2 P.M..... | Laying 8 to 30-in. mains, inc. intake line; 6,000,000-gal. filtration plant; water-softening plant and bldg., 10,000,000 gals.; 400-h. p. boiler; two 7,000,000-gals. low-lift centrifugal and 5 smaller pumps, meters, etc..... | Geo. B. Herwick, Chm. Water Com'rs. |

Water Supply—Continued

| | | | | |
|---------------------|--------------------|-----------------------|---|------------------------------------|
| Pennsylvania..... | Bradford..... | April 20..... | Building 4,000,000-gal. reservoir..... | A. F. Bannon, Jr., City Engineer. |
| South Carolina..... | Fort Moultrie..... | April 24, 11 A.M..... | Extending water system to 3 batteries..... | W. N. Michel, Quartermaster. |
| South Carolina..... | Hartsville..... | May 1, noon..... | Water system, inc. artesian well, steam and electric pumps, rein. conc. reservoir, steel tank and tower 3 miles c. i. 6-10-in. mains. | J. J. Lawton, Chm. Bd. Pub. Wks. |
| Oregon..... | Astoria..... | May 2, 2 P.M..... | Constructing storage reservoir dam, 1,000,000,000 or 220,000,000-gal. 3 sets plans, cost, \$55,000, \$75,000 and \$90,000..... | G. W. Lounsbury, Clk. Water Com'r. |
| Connecticut..... | New Britain..... | May 15..... | Building intake at Burlington; cost, \$300,000 | P. M. Blake, Newtonville, Mass. |
| Texas..... | Fort Bliss..... | June 3, noon..... | Sinking 12-in. tubular well; installing pump; 150,000-gal. steel tank on 70-ft. trestle, two 40-h. p. boilers..... | Constructing Quartermaster. |

Sewerage

| | | | | |
|---------------------------|------------------|------------------------|--|---|
| New York..... | New York..... | April 4, 11 A.M..... | Constructing sewers in Bronx; 3 contracts.. | Louis F. Haffen, Pres. Boro. |
| Virginia..... | Suffolk..... | April 4, noon..... | Constructing 100 ft. of brick sewer..... | J. H. Macleary, Chm. St. Com. |
| Kansas..... | Hiawatha..... | April 4, 8 P.M..... | Constructing several lateral sewers..... | Chas. Wolf, City Clerk. |
| New York..... | Ithaca..... | April 4, 8 P.M..... | Building reinforced concrete septic tanks, inc. 1,100 cu. yds. concrete, piping, valves, etc..... | H. L. Stewart, Supt., Sewer Com'rs. |
| Iowa..... | Des Moines..... | April 5, 11 A.M..... | Constructing Grand View sewer system, including 10,449 ft. 10-20-in. sewer..... | W. W. Wise, Bd. Pub. Works. |
| Massachusetts..... | Boston..... | April 5, 2:30 P.M..... | Constructing 2,168 ft. 60-72-in. sewer in rock and earth trench, Section 84, high level sewer | W. M. Brown, Ch. Engr., Met. Sewer Works. |
| Wisconsin..... | Fond du Lac..... | April 6, 2 P.M..... | Constructing 21,000 ft. storm sewer..... | L. A. Pettibone, City Engineer. |
| Wisconsin..... | Oshkosh..... | April 8, noon..... | Constructing sewer in Oregon St..... | W. A. Marden, Pres. B. P. W. |
| Connecticut..... | New Canaan..... | April 8, noon..... | Constructing 2 1-8 miles 12-6-in. pipe sewer, etc..... | E. Worthington, Engineer. |
| Idaho..... | Blackfoot..... | April 8..... | Sewer system for Co. Court House and jail.. | County Commissioners. |
| Ohio..... | Ravenna..... | April 9..... | Building 10 1/2 miles 8-18-in. pipe sewer, etc.. | E. W. Marvin, Village Clerk. |
| Maryland..... | Baltimore..... | April 10, 11 A.M..... | Building outfall sewer, Sections 3 to 10, inc. 23,353 lin. ft. 11 ft. by 12 ft. 3 in. concrete sewer, high level interceptor, 5,200 ft. 8 ft. 4-in concrete sewer; west low level interceptor, 3,605 ft. 74, 76, 80, 84-in. circ. conc. sewer; clearing and grading 120 acres, with excavation embankment and underdrain for Disposal Works..... | E. Clay Timanus, Mayor. |
| West Virginia..... | Parkersburg..... | April 11, 8 P.M..... | Building two-ring brick storm sewer; 6 ft. diameter, 800 ft. long..... | J. V. Dunbar, City Engineer. |
| District of Columbia..... | Washington..... | April 12, noon..... | Constructing sewers..... | H. B. F. Macfarland, Commissioner. |
| District of Columbia..... | Washington..... | April 15, noon..... | Construction of sewer..... | H. B. F. Macfarland, Commissioner. |
| Saskatchewan..... | Battleford..... | April 15..... | Constructing sewer system..... | R. C. Laurie, City Sec'y-Treas. |
| Oklahoma..... | Hobart..... | April 20..... | Storm sewer, of brick, pipe and concrete..... | O. E. Noble, City Engineer. |
| British Columbia..... | Fernie..... | April 30, 4 P.M..... | Constructing sewer system..... | J. W. Munn, City Clerk. |
| South Carolina..... | Camden..... | May 1, noon..... | Constructing sewers..... | H. G. Carrison, Chm. Sew. Com's. |
| South Carolina..... | Hartsville..... | May 1, noon..... | Laying 3 1/2 miles sewer, 8-18-in., 6-20 ft. deep. | J. J. Lawton, Chm. Bd. Pub. Wks. |

Public Buildings

| | | | | |
|---------------------------|-----------------------|----------------------|--|---|
| Texas..... | Fort Sam Houston..... | April 4, 11 A.M..... | Electrical work in 5 bldgs., etc..... | L. J. Fleming, Q. M. |
| South Carolina..... | Columbia..... | April 4, noon..... | Interior repairs, reinforcing ceilings; cost, \$12,000..... | State House Commission. |
| Pennsylvania..... | Arden..... | April 4, noon..... | New Building for Children's Home..... | Andrew McMaster, Pittsburgh, Arch. |
| Virginia..... | Surry..... | April 4, 2 P.M..... | Erecting County Court House..... | A. S. Edwards, County Clerk. |
| New York..... | New York..... | April 4, 3 P.M..... | Installing steel-tile cases, mezzanine floors, etc., at Custom House..... | Cass Gilbert, Architect. |
| Georgia..... | Macon..... | April 4, 3 P.M..... | Conduit and wiring Post Office annex..... | J. K. Taylor, Washington, D. C. |
| Ohio..... | Leipsic..... | April 4..... | 2-story, \$35,000 brick and stone high school.. | W. Lewis Kramer, Findlay, Arch. |
| New York..... | Delmar..... | April 5..... | Erecting school, inc. heating, etc..... | Alex. Selkirk, Albany, Architect. |
| Iowa..... | Emmettsburg..... | April 5..... | Erecting jail and sheriff's residence..... | Sim. R. Stedman, County Auditor. |
| Colorado..... | Denver..... | April 8, 3 P.M..... | Extension, remodeling, etc., U. S. Post Office. | J. K. Taylor, Washington, D. C. |
| Ohio..... | Cleveland..... | April 8..... | Erecting addition to Rice school..... | Peter Witt, City Clerk. |
| Illinois..... | Carthage..... | April 9, 2 P.M..... | Erect'g new Co. Court House; cost, \$115,000. | J. W. Westfall, Co. Clerk. |
| New York..... | Little Falls..... | April 9, 3 P.M..... | Constructing U. S. Post Office, complete..... | J. K. Taylor, Washington, D. C. |
| New York..... | New York..... | April 10, 3 P.M..... | Additional toilet rooms, U. S. Post Office.. | J. K. Taylor, Washington, D. C. |
| North Carolina..... | Beaufort..... | April 10..... | Erecting County Court House..... | W. L. Arrington, Clk., Co. Com'rs. |
| Texas..... | Terrell..... | April 10..... | Erecting main building and 2 dormitories, North Texas Univ.; cost, \$60,000..... | C. A. Gill & Son, Dallas, Arch. |
| New York..... | New York..... | April 11, 3 P.M..... | Interior finish, New York Pub. Library..... | Carrere & Hastings, Architects. |
| North Carolina..... | Asheville..... | April 11..... | Constructing extension to U. S. Post Office.. | J. K. Taylor, Washington, D. C. |
| District of Columbia..... | Washington..... | April 12, 3 P.M..... | Repairs to east front Treasury bldg.; cost, \$350,000..... | James Knox Taylor, Supervising Arch. |
| Texas..... | Tyler..... | April 15, 3 P.M..... | Extension to U. S. Post Office and Court House. | J. K. Taylor, Washington, D. C. |
| Ohio..... | Columbus..... | April 15..... | Erecting \$60,000 dormitory, State Univ. ... | Mills & Haydon, Architects. |
| New York..... | West Point..... | April 15..... | Tile and marble work, old Cadet barracks.. | Quartermaster. |
| Ohio..... | Cleveland..... | April 15..... | Erecting annex, complete to Brandon school. | Peter Witt, City Clerk. |
| Texas..... | Paris..... | April 15..... | Erecting addition to hospital; cost, \$15,000.. | Ed. H. McCinston, Mayor. |
| Ohio..... | Delaware..... | April 16, noon..... | Erecting indus. and tech. bldg. Indus. Home.. | Marriett & Allen, Columbus, Arch. |
| Ohio..... | Columbus..... | April 17, noon..... | Erecting Engineering bldg., woman's dormitory, etc., Ohio State University..... | Carl E. Steeb, Sec'y Bd. Trus. |
| Ohio..... | Columbus..... | April 17, noon..... | Installing hot-water heating system in bldgs. of Ohio Inst. Educ. Deaf and Dumb..... | J. W. Jones, Sec'y Bd. Trus. |
| North Dakota..... | Bottineau..... | April 17..... | Erecting School of Forestry bldg.; cost, \$25,000..... | David Clark, Chm. Bd. Trustees. |
| Michigan..... | Flint..... | April 18, 3 P.M..... | Constructing U. S. Post Office..... | J. K. Taylor, Washington, D. C. |
| Ohio..... | Ashland..... | April 18..... | Erecting \$25,000 school building..... | G. A. Ullman, Clk. Bd. Educ. |
| Ohio..... | East Cleveland..... | April 20, noon..... | Completing, etc., Superior St. school..... | H. F. Jordan, Clk. Bd. Educ. |
| Illinois..... | North Chicago..... | May 1, noon..... | Bldgs. at Naval Training Station..... | Jarvis Hunt, Chicago, Architect. |
| South Dakota..... | Pierre..... | June 4..... | Constructing Capitol bldg.; cost, \$600,000... | Bell & Detweiler, Northwestern Bldg. Minneapolis, Minn., Archs. |

Bridges

| | | | | |
|-------------------|---------------------|------------------------|--|---|
| Washington..... | Prosser..... | April 4, 4 P.M..... | Erecting 2 spans 16 ft. wide 124 ft. long of combination or steel with 4 concrete piers. | W. S. Jenkins, County Auditor. |
| New Jersey..... | Hoboken..... | April 4..... | Building viaduct, 3 sections; cost, \$155,000.. | Walter O'Mara, Clerk Bd. Chosen Freeholders, Jersey City. |
| Indiana..... | Indianapolis..... | April 5, 10 A.M..... | New boilers, pumps, heaters, etc., Court House..... | C. J. Clark, Co. Auditor. |
| South Dakota..... | Mitchell..... | April 5..... | Building 3 steel bridges, each 60 ft. long..... | A. B. Anderson, County Auditor. |
| California..... | San Bernardino..... | April 6, 11 A.M..... | Building 45-ft. span: concrete piers..... | Chas. Post, County Clerk. |
| Ohio..... | Cleveland..... | April 6, 11 A.M..... | Constructing bridge, Report No. 1482..... | A. B. Lea, County Engineer. |
| Ohio..... | Bryan..... | April 6, 11 A.M..... | Constructing twelve county bridges..... | County Auditor. |
| Texas..... | Fort Worth..... | April 8, 9 A.M..... | Building 100-ft. steel span with approaches.. | C. J. McKenna, County Auditor. |
| Indiana..... | South Bend..... | April 8, 11 A.M..... | Melan arch bridge of three 80-ft. spans; also re-erecting steel bridge, 2 spans, 126 ft. on new concrete substructure..... | A. J. Hammond, Engineer. |
| Kentucky..... | Louisville..... | April 8, noon..... | Steel or wrought-iron trestles, etc., for Boule dam..... | Capt. H. Burgess, Eng'r Corps, U. S. A. |
| Ohio..... | Salem..... | April 8..... | Constructing substructure of bridge..... | G. A. Sheets, Co. Auditor, Lisbon. |
| Idaho..... | Shelley..... | April 8..... | 3 steel spans, masonry and tubular piers..... | H. B. Curtis, Clk. Bd. Co. Com'rs. |
| New Jersey..... | Trenton..... | April 9, 2:30 P.M..... | Erecting steel concrete bridge; reinforced concrete floor; iron pipe culvert, etc..... | Frank J. Eppele, County Eng'r. |
| Minnesota..... | Duluth..... | April 9..... | Building 120-ft. steel span; 18-ft. approaches. | O. Halden, County Auditor. |
| Indiana..... | Fort Wayne..... | April 10, 10 A.M..... | Building steel bridge; 2 spans, 170 ft. each; also 2 abutments and pier and concrete and creosoted floor, Maumee twp..... | Auditor, Allen County. |

Bridges—Continued

| | | | | |
|-------------------|------------------|---------------------|--|------------------------------------|
| Illinois..... | Hardin..... | April 10, 10 A.M. | Erecting masonry arch bridge..... | John Day, Jr., County Clerk. |
| Ohio..... | Newark..... | April 11, 1:30 P.M. | Erecting concrete steel span, 38 ft. long..... | J. N. Wright, County Auditor. |
| Washington..... | Wenatchee..... | April 11, 2 P.M. | Erecting 2 bridges, steel or combination..... | John Godfrey, Clk. Co. Com'rs. |
| Pennsylvania..... | Somerfield..... | April 11..... | Repairing stone bridge on National Pike..... | J. W. Hunter, Harrisburg, Com'r. |
| Indiana..... | Greensburg..... | April 11..... | Constructing concrete arch bridge..... | Frank E. Ryan, County Auditor. |
| Ohio..... | Granville..... | April 11..... | Building 25-ft. span, concrete steel span..... | H. L. Maddocks, County Engineer. |
| Ohio..... | Cincinnati..... | April 12, noon..... | Reinforced box culvert, Sycamore twp..... | Fred. Drehs, Co. Com'rs. |
| Ohio..... | Cleveland..... | April 13, 11 A.M. | Building 2 steel-concrete bridges..... | A. B. Lea, County Surveyor. |
| Colorado..... | Denver..... | April 15, 11 A.M. | Building reinforced concrete highway bridge..... | C. E. Randolph, Pres. B. P. W. |
| Ohio..... | Lancaster..... | April 20..... | Masonry work 4 abutments, 2 bridges..... | Fred L. Mauger, Co. Auditor. |
| Pennsylvania..... | Norristown..... | April 20..... | Constructing two bridges..... | Montgomery County Commissioners. |
| Nebraska..... | Beatrice..... | April 23..... | Constructing County bridges during year..... | County Commissioners. |
| Montana..... | Glendive..... | April 25, 2 P.M. | Constructing 16 steel and 20 combination wood and steel highway bridges..... | H. N. Savage, Huntley, Superv. Eng |
| Louisiana..... | New Orleans..... | April 29, 1 P.M. | Constructing viaduct in Algiers..... | Charles R. Kennedy, Comptroller. |
| Washington..... | Seattle..... | April 30, 3 P.M. | Installing conduit and wiring system, U. S. P. O..... | J. K. Taylor, Washington, D. C. |
| Pennsylvania..... | Pottsville..... | May 1..... | Erecting two steel bridges..... | Chas. T. Strangin, Co. Controller. |

Miscellaneous

| | | | | |
|---------------------------|--------------------|---------------------|---|---|
| Massachusetts..... | Boston..... | April 4, noon..... | Constructing Section 6, Washington St. tunnel..... | B. Leighton Beal, Sec'y Transit Com. |
| Michigan..... | Muskegon..... | April 4, 3 P.M. | Repairing South pier..... | Col. M. B. Adams, Grand Rapids. |
| Indiana..... | Indianapolis..... | April 5, 10 A.M. | New boilers, pumps, heater, etc., power house..... | Marion County Commissioners |
| Ontario..... | Fort Erie..... | April 5..... | Installing electric-light plant in village..... | B. F. Matthews, Town Clerk. |
| California..... | Los Angeles..... | April 8..... | Franchise to build, and operate for 40 yrs., electric r.r. on portions of 5 streets..... | C. G. Keyes, Clerk Bd. Supervisors. |
| Florida..... | Pensacola..... | April 9, 10 A.M. | Furnishing cement, sand, manhole frames, hardware, etc., 3 naval stations..... | Bureau Supplies and Accounts, Navy Dept., Washington, D. C. |
| Illinois..... | Chicago..... | April 10..... | Furnishing 25,000 ft. 1-in. and 5,000 ft. 1½-in. hose..... | G. Shurmay, Sec'y S. Park Com'rs. |
| Manitoba..... | Brandon..... | April 11, noon..... | Supplying 6,000 to 8,000 bbls. Port. cement..... | W. H. Shillinglaw, City Engr. |
| New York..... | New York..... | April 11, noon..... | Constructing Route No. 9, rapid transit railway; tunnel, iron or steel and masonry; min. ht. 13 ft.; max. width of each track 15 ft.; 4 tracks Centre St.; 2 in Walker and Canal..... | Rapid Transit Commissioners. |
| Illinois..... | Evanston..... | April 13, 8 P.M. | Constructing book stacks, public library..... | Commissioner of Public Works. |
| Colorado..... | Montrose..... | April 15, 3 P.M. | Furnishing 30,000 bbls. Portland cement..... | J. R. Gafield, Washington, D. C. |
| Missouri..... | Chillicothe..... | April 15..... | Constructing electric plant; cost, \$100,000..... | Burns & McDonnell, Kansas City, Engrs. |
| Kentucky..... | Bowling Green..... | April 15..... | Bldg. \$60,000 plant, Green River Hydro. Elec. Co..... | H. von Schon, Consult. Eng'r. |
| Saskatchewan..... | Battleford..... | April 15..... | Constructing electric-light plant..... | R. C. Laurie, City Sec'y-Treasurer. |
| Alabama..... | Birmingham..... | April 17, 2 P.M. | Erecting 60 also 100-ton garbage crematory..... | Julian Kendrick, City Engineer. |
| Virginia..... | Clifton Forge..... | April 18, 8:30 P.M. | Constructing electric lighting system..... | John A. Bowers, Mayor. |
| Virginia..... | Clifton Forge..... | April 18..... | Purchase of a franchise for lighting village streets by electricity..... | E. A. Smead, Pres. Council. |
| Oregon..... | Portland..... | April 22, 11 A.M. | Erecting 100-ton garbage crematory..... | Thomas C. Devlin, City Auditor. |
| District of Columbia..... | Washington..... | April 22, 2 P.M. | Furnishing electrical supplies, paints, hardware, etc., for District, year begin. July 1..... | H. B. F. Macfarland, Commissioner |
| New York..... | Schenectady..... | April 24, 2 P.M. | Disposal of ashes, rubbish, garbage and dead animals by incineration or other process..... | L. B. Sebring, City Engineer. |
| Mississippi..... | Natchez..... | May 1, 4 P.M. | Lighting city for 10 yrs. from March 1, 1909..... | A. C. Berdon, Chm. Light Com. |
| Iowa..... | Des Moines..... | May 2, 11 A.M. | Improving channels, Raccoon and Des Moines Rivers..... | W. W. Wise, Bd. Pub. Works. |
| California..... | Los Angeles..... | May 6, 2 P.M. | Constructing boilers, engines, generators and motors for 1250-h.p. to Aqueduct Cement Works..... | Horace B. Ferris, Sec'y Bd. Pub. Works. |

STREET IMPROVEMENTS

North Birmingham (Birmingham post-office), Ala.—Bids are being received for laying 26 miles of curbing, 26 miles of sidewalks, 13 miles macadam streets and 3,000 lineal feet brick pavement.

Fullerton, Cal.—A special election will be held to decide the question of issuing \$80,000 bonds for street improvements.

Pasadena, Cal.—Council is considering improving a number of thoroughfares and the construction of sewers.

Waterbury, Conn.—It has been voted to pave Baldwin, Bishop and Elizabeth streets; it is estimated that it will cost \$3,050 to construct sewers on Woodlawn terrace.—William E. Thoms, Mayor; R. A. Cairns, City Engineer.

Americus, Ga.—Bonds, \$40,000, have been voted for paving streets.—E. A. Hawkins, Mayor; Chas. W. Murray, City Engineer.

Atlanta, Ga.—Council is preparing to repave Broad street with wooden blocks.—W. R. Joyner, Mayor.

Athens, Ill.—Council has decided to build cement walks in several streets.

Bloomington, Ill.—The Board of Public Works is preparing plans to improve Clinton street by paving.

Clay City, Ind.—Harrison township has voted \$77,000 bonds for building additional gravel roads.

Fort Wayne, Ind.—The Board of Public Works has directed estimates to be prepared for paving certain portions of Union street.

Indianapolis, Ind.—The Board of Works has adopted resolutions for cement walks, creosoted wooden block roadways, gravel roadways and other improvements.

Marion, Ind.—O. J. Simmons has the contract for paving 7th street with brick, a distance of one mile, for \$20,000.

Portland, Ind.—Council has decided to pave certain portions of West Main street with brick; a number of other streets and alleys will also be paved.

Des Moines, Ia.—Council plans to pave a large number of streets; the material has not yet been ordered, but will be as soon as the property owners designate the kind desired.

Iola, Kan.—Arrangements are being made to pave certain portions of Walnut street.

Covington, Ky.—The extension of Greer

avenue has been authorized; it will be 43 feet wide, and will cost \$15,000.

Dayton, Ky.—Dr. W. G. Richards has been elected President of the local Improvement Committee, which will immediately take up the question of paving Sixth avenue with brick and a sanitary sewer for the entire city.

Mt. Sterling, Ky.—The citizens will vote on issue of \$100,000 bonds for constructing brick streets and a sewerage system.

Arcadia, La.—Arrangements are being made to issue bonds for improving roads.

Detroit, Mich.—The Commissioner of Parks and Boulevards has been requested to submit a supplemental estimate for the purpose of constructing a brick or concrete roadway on either side of the west approaches to Dequindre street bridge on the Northern Grand Boulevard east, in the sum of \$16,379; other paving matters are also being considered by Council.—J. J. Haarer, Commissioner of Public Works.

Essexville, Mich.—Council has directed estimates to be prepared for paving Woodside avenue, from city limits to the end of the thoroughfare; estimated cost, \$30,000.

Grand Rapids, Mich.—The Board of Public Works has been requested to submit estimates for grading, paving, etc., a number of streets; also for constructing sewers.—John L. Boer, City Clerk.

Menominee, Mich.—Preliminary steps providing for the paving of ten streets have been taken by Council, with the exception of one street; the material will be tar macadam.

Houghton, Mich.—The main street of Linden will be paved during the coming summer; the material is not decided on, but it is likely that macadam will be used.

Carson City, Nev.—The city is preparing to issue \$500,000 bonds for the erection of a warehouse and improving streets.

Jersey City, N. J.—The Street and Water Board has requested an appropriation of \$104,830 for repaving fifteen streets, and the same is being considered by the Board of Finance.—Mark M. Fagan, Mayor.

Newark, N. J.—Plans and specifications are being prepared for paving eight streets with granite, three with asphalt, three with telford, two with bituminous macadam and one with brick; these are the last, with the

exception of three streets, of a list made up two months ago, to be paved during the season.—Morris R. Sherrerd, City Engineer.

Charlotte, N. C.—Council is considering the construction of 20 or 25 blocks of street paving.—J. H. Rose, Chairman, Street Committee.

Ashtabula, O.—Maple street is to be paved a width of 24 feet, and Lake street is also to be paved and curbed; the City Engineer has been authorized to prepare plans.

Cambridge, O.—The ordinance to pave North Eleventh street has passed Council; bids will be invited as soon as plans can be prepared.

Canton, O.—Harry Corl has the contract for paving South Market street, at \$11,000; Jno. D. Dunbar, the contract for improving West Lake street by constructing sidewalks, curbing and cross-walks, at \$3,100; Jos. George will construct the curbing, sidewalks and cross-walks in Chance avenue, at \$6,180; Harry Corl will also improve Reynolds street by grading and laying sidewalks; Nelson and Larson have the contract for improving Garfield avenue, at \$4,400, and Downs and Campbell have the contract for the work in Blain avenue.

Carrollton, O.—Engineer Meyers of Canton has prepared profiles and specifications for the proposed street paving, calling for an outlay of over \$18,000; he proposes to use paving block and straight curbing.

Cincinnati, O.—City Engineer Danenhauer estimates that the cost of new artificial stone sidewalks and the paving of the roadway of the Eighth street viaduct will cost \$41,000.

Clyde, O.—The village of Lindsay will pave Main street the coming season.—J. C. Overmeyer, Engineer.

Dayton, O.—Council has passed resolutions for the paving of a dozen streets and avenues; plans are about to be prepared and contracts awarded.

Fostoria, O.—The petition for paving High street will be presented to Council at its forthcoming meeting; Engineers Riggs and Sherman, of Toledo, have been retained to survey a number of streets preparatory to a large amount of paving; a large number of sidewalks are also to be paved the coming season.

Girard, O.—The bid of Virgil E. Jones of Youngstown has been accepted by Council

for the construction of a large number of sidewalks, at 15 cents per square foot.

Hamilton, O.—Engineer L. A. Dillon has presented plans for improving South D street; the estimate, calling for stone curbing, means an expenditure of \$24,000, and for combined cement and gutter, \$23,000.

Lima, O.—Council has directed plans and specifications to be prepared for paving many streets.

Lisbon, O.—Council has ordered the paving of Chestnut street early in the spring; it will be paved from Market east to Prichard avenue, and fire brick to a width of 28 feet will be laid.

Lorain, O.—Bank street will be paved from Washington to Oberlin avenue; the paving of Reid street and the macadamizing of Oakwood street will likewise be authorized.

Loudenville, O.—Engineer F. L. Niederheiser has prepared preliminary plans for paving Main street.

Mansfield, O.—South Main and North Main streets are to be improved by piking; the improvement of West First street and several other streets by stone and cement sidewalks is to be authorized.

Middletown, O.—The Mayor has approved the ordinance for paving Third street, but has vetoed the ordinance for the paving of Suphem by macadamizing.

New Lexington, O.—Resolution to submit plans and estimates for the paving of most of the streets of this village is being considered.—E. W. Stinchcomb, Mayor.

Richwood, O.—Jas. C. Kennedy has been employed to establish the grade of Franklin street and to make plans for paving, macadamizing, curbing and other street work; a large amount of municipal work is to be done this season.—J. L. Horn, Chairman, Street Committee.

Sycamore, O.—Council of the village of Nevada has decided to issue bonds for the extension of the macadamizing of Main street to its full width of 60 feet; also for putting in curbing and gutters.

Toledo, O.—Mayor Whitlock has approved the ordinance authorizing the issue of \$106,000 municipal bonds for street improvements; the largest contract to be let is that of the repaving of Summit avenue, which will cost \$40,000.

Warren, O.—The paving of Galatine street with brick, a distance of 1,000 feet, will probably be authorized by Council.

Wellston, O.—President Bunn of the Council states that legislation is being considered for improving a number of streets, including the macadamizing of a number of country roads.

Wooster, O.—Council has decided to pave Bever street and Columbus avenue; brick will be used; plans and specifications will be immediately prepared.

Anderson, S. C.—Council is arranging to offer for sale \$75,000 street improvement bonds.

Charleston, S. C.—Council has decided to issue \$75,000 bonds for street improvements.

Fredericksburg, Va.—Spottsylvania county has called an election to vote on the question of issuing \$50,000 county road bonds.

Milwaukee, Wis.—The Board of Public Works is preparing to improve certain streets by asphalt paving.

Union City, Tenn.—A levy of \$10,000 has been made with which to commence four miles of street work to be done on four of the leading streets; it has not been decided whether the work will be done by contract or the city perform the work.—Address the Mayor.

Alexandria, Va.—The Street Committee desires to have the upper portion of King street paved with vitrified brick; a sewer is also to be constructed.—City Engineer Dunn.

Grafton, W. Va.—The issue of \$37,000 bonds for paving and for waterworks extension will doubtless be authorized.—Jno. W. McClung, Mayor.

Ottawa, Ont., Can.—The city will lay concrete sidewalk on Somerset street from LeBreton to Division street and tar macadam pavement, 36 feet wide, on Gladstone avenue between Bank and Bell street; estimated cost, \$43,065.—E. R. Beckwith, City Engineer.

Prince Albert, Sask., Can.—City Engineer Moon is taking levels for five miles of pavements to be laid this summer; estimated cost, \$500,000.

SEWERAGE

Suisun, Cal.—The Town Board has adopted plans and specifications for a sewer system.

Ukiah, Cal.—The City Engineer has been instructed to establish lines on Holden street and prepare plans and specifications for constructing sewer on Clara avenue.

Richmond, Ind.—Bids will be received for construction of sewer system, estimated to cost \$50,000.

Rushville, Ind.—Council has approved plans and specifications for constructing complete sewer system; bids will soon be asked.—Alonzo L. Stewart, City Engineer.

Mount Sterling, Ky.—Arrangements are being made to issue \$100,000 bonds for building sewer system and paving with brick.

Laurel, Md.—The Laurel Improvement Association has passed a resolution asking the Mayor and Council to bond the town for \$50,000 to build an electric plant and sewerage system; a committee will be appointed to investigate and report in detail upon the sewerage plan.

Salem, Mass.—Council will expend \$100,000 in building sewers on the West Side.

Detroit, Mich.—The Council Committee on Sewers has approved of the proposed Schroeder sewer in the 18th Ward, which is to cost \$96,000.

St. Paul, Minn.—Council has appropriated \$58,000 to aid in constructing South street sewer system, which is to be extended over 12,000 lineal feet; estimated cost, \$82,583; bids will soon be asked.

Beatrice, Neb.—The city contemplates constructing vitrified pipe sewer; estimated cost, \$25,000.—S. H. Avery, City Clerk.

Omaha, Neb.—Council has authorized an issue of \$150,000 sewer bonds.

Binghamton, N. Y.—The Ogden-Hering route for the Fourth Ward sewer has been approved by the State Commissioner of Health; cost, \$79,000; bids will soon be asked.—S. M. Baird, City Engineer.

Barberton, O.—The cost of the storm sewer for sub-district No. 1 amounts to a little over \$11,000; the necessary legislation is to be immediately prepared.

Bucyrus, O.—A petition for the construction of a sewer on Reed avenue has been presented to Council; plans for the sewer on Plymouth street have been prepared, and legislation for its immediate construction introduced.

Canal Dover, O.—Le Chapin of Canton has been retained to prepare plans for sewer district No. 2; bids will be received within sixty days.

Chagrin Falls, O.—The proposition to issue \$18,000 sewer bonds carried.

Elyria, O.—The ordinance for constructing a big storm water sewer in Fairlawn and Sugar Ridge district has passed Council.

Lorain, O.—The Penfield avenue storm water sewer is to be built according to the new plans, which call for the extension of the sewer as far south as Colgate street; the resolution to build the Pearl street district sewer has also passed Council.

Massillon, O.—Schott and Kraft have been awarded contract for the sanitary sewers in Center and Woodland avenues.

Mt. Vernon, O.—The City Engineer has been instructed to prepare an estimate of the cost of the proposed sewer extension in Catherine avenue.

Sandusky, O.—Councilman John A. Diederma, Chairman of the committee having in charge the filtration plant matter, states that a bond issue of \$75,000 will probably be needed for this improvement, and it is likely that an expert engineer will be employed.

Springfield, O.—M. J. Hannan has the contract for constructing a sanitary sewer in Ferncliff avenue.

Urbana, O.—The question of sewerage for this city and the construction of a sewage plant is to be taken up actively by Council at an early date.

St. Marys, Pa.—At a special election recently it was voted to increase the borough debt by \$50,000 to provide for installation of sewerage system.

Baden, Pa.—Plans are being prepared by J. P. Leaf, of Rochester, for constructing sewerage system; estimated cost, \$5,000.

Rochester, Pa.—Plans are being prepared by J. P. Leaf for constructing 10-inch sewer.

Camden, S. C.—The citizens have voted bonds for installing a sewerage system; it is desired to have the work completed by January 1 next.

Dallas, Tex.—An election will be held to decide the question of issuing \$40,000 bonds for sewerage purposes.

Charleston, W. Va.—City has voted \$250,000 bonds for sewerage the city and improving its sanitary condition.

WATERWORKS

Madison, Ga.—The citizens have voted \$25,000 bonds for a waterworks system.

Danforth, Ill.—Council is arranging to establish a waterworks system.

Evansville, Ind.—A committee has been appointed to secure plans and specifications for filtration plant.

Eldorado, Kan.—The water supply is inadequate; the plan of securing water by artificial wells is a failure.

Baton Rouge, La.—The Yazoo-Mississippi Valley Railway Company is preparing to establish a water plant.

Battle Lake, Mich.—Council has decided to purchase the electric-light plant and construct a water system.

Grand Rapids, Mich.—The Grand Rapids Hydraulic Company is planning to expend \$20,000 for improvements to water plant.

Saginaw, Mich.—Council has approved an issue of \$50,000 water bonds.

Battle Lake, Minn.—A waterworks system will be constructed.

Gunnison, Miss.—The city will soon install waterworks system.

Gallon, O.—The employment of hydraulic engineers to investigate and report on the waterworks matter is now before Council.

Ironton, O.—A \$50,000 bond issue will be authorized for the extension of the waterworks system.

Medina, O.—The citizens have voted \$55,000 bonds for municipal waterworks and sewer system.

Youngstown, O.—Options on 500 acres have been secured on which the construction of a waterworks plant is recommended; the dam with floodgates, etc., will cost \$175,000; the capacity is estimated at 11,000,000 gallons a day; the cost of the entire plant will be \$200,000.—Address G. D. Thomas.

Zanesville, O.—The question of a bond issue to improve the city water supply by filtration will be taken up at once; John P. Forde, of Columbus, will probably prepare the plans for this improvement.

Cordell, Okla.—Bonds, \$20,000, have been voted for the extension of the water system and the establishment of a lighting plant.

Prague, Okla.—Bonds, \$30,000, have been voted for a complete water system.

Enterprise, Ore.—Dunn & Dunn, of Seattle, have completed plans for the proposed gravity system of waterworks; estimated cost, \$30,000; the question of issuing bonds will be submitted to a vote of the people.

Butler, Pa.—The Butler Water Company will expend \$100,000 in further improving its plant, which furnishes water to the people of this city and Lyndora; a new pump with a capacity of 6,000,000 gallons is to be installed and five miles of 24-inch pipe from the Boydstown dam will be laid.

Lewisburg, Tenn.—The City Engineer has been directed to prepare plans for water system; the question of issuing bonds for the purpose will be submitted to a vote of the people.

Gilmer, Tex.—The Attorney General has approved issue of \$32,000 waterworks bonds.

La Porte, Tex.—F. A. Peters and J. B. F. Robinson have been granted franchise to establish waterworks system, the consideration being that the plant be in operation within 18 months.

Maypearl, Tex.—A waterworks system will soon be constructed.

Nacogdoches, Tex.—The proposition to issue \$150,000 bonds for establishing water plant carried.

Millville, Utah.—The Millville Water Company has been organized with a capital stock of \$10,000.—E. M. Hammond, President.

Burlington, Vt.—The question of installing a filtration plant is being discussed.—Frank O. Sinclair, City Engineer.

Swanton, Vt.—A. G. Webster, D. G. Furman and A. E. Carr have been appointed a committee to act with the Village Trustees in installing complete water supply system; bids will soon be asked; plans have been prepared by John L. Collins, Albany, N. Y.; the supply will be taken from Fairfield pond; estimated cost, \$75,000.—L. A. Lapelle, Town Clerk.

Bellingham, Wash.—The Water Board has employed W. T. Chalk, of Seattle, to make surveys for waterworks to be constructed within 18 months; estimated cost, \$500,000.

Brandon, Man., Can.—Bids will soon be asked by Council for furnishing 200 ½-inch corporation stops, 240 ½-inch curb stops, 15,000 pounds ½-inch lead pipe, and 240 service boxes.—W. H. Shillinglaw, City Engineer.

London, Ont., Can.—The Water Commissioners have decided to spend \$36,750 for service and extending water mains.

Welland, Ont., Can.—A waterworks system will be constructed; cost, \$70,000.

Wetaskiwin, Alta., Can.—The ratepayers have passed a by-law to provide \$150,000 for constructing waterworks and sewerage systems.

LIGHTING AND ELECTRICITY

Huntsville, Ala.—The Huntsville Railway, Light and Power Company proposes to build an extension.

Fort Smith, Ark.—Council proposes to install a municipal lighting plant, at a cost of \$12,000.

Lake Village, Ark.—Council has decided to establish an improvement district, it is reported, for construction of waterworks and an electric-light plant.

Ozark, Ark.—Council has granted an electric-light franchise for 15 years to the Altus Gin and Manufacturing Company.

Red Bluff, Cal.—The Mill Creek Power Company has been incorporated to operate the Northern Power Company, to furnish power and manufacture gas for heating, lighting, etc.

Jacksonville, Fla.—An election will be held, on April 16, on the granting of a street railway and electric-lighting franchise to the Jacksonville Electric Company.—Wm. H. Baker, Mayor.

Madison, Ga.—The city, on March 15, voted \$65,000 for improving electric-light plant, building of waterworks and sewerage system.—E. H. Davis, Griffin, Engineer; P. S. Burney, Mayor.

Wallace, Idaho.—G. Scott Anderson, one of the owners of the Big Creek water right, is about to incorporate a company to be known as the Inland Power Company; the cost of the plant is estimated at \$300,000; Stephen F. Wright, of Butte, Mont.; G. Scott Anderson, of Wallace, and others, incorporators; about \$20,000 has already been spent by Mr. Anderson and his associates and many applications for power have already been made.

Freeport, Ill.—C. E. Gregory, of Chicago, has petitioned for franchise to establish a lighting plant.

Peoria, Ill.—The Morton Light, Heat & Power Co. has been incorporated with a capital stock of \$18,000, by Henry Beyer, Wm. R. Lockland and others; the company proposes to furnish electricity, gas, steam heat and hot water.

Iola, Kan.—The Lanyon Zinc Company will install a \$50,000 electric power plant; the other zinc company proposes to place electric power also.

Morocco, Ind.—W. B. Harpole, owner of the electric-light plant, contemplates installing a new engine in power-house.

Holden, Mass.—Council has decided to investigate the advisability of establishing a municipal lighting plant; William D. Cheney and Stillman F. Morris were appointed a committee to investigate the matter.

Lowell, Mass.—The Lowell Electric Light Corporation has received a permit to erect a \$100,000 building in Perry street, and addition to its plant; the new structure will be 75x108 feet, one story high; attached to the building will be a 195-foot chimney.—Norman T. Wilcox, Local Manager; Stone & Webster, Boston, General Managers.

Plainville, Mass.—The Selectmen have appointed a committee to investigate the cause of installing a 50-electric street light plant in town.

Grand Rapids, Mich.—The Grand Rapids-Muskegon Power Company will petition Council for franchise.—W. A. Fotte, President.

Holland, Mich.—The Board of Public Works contemplates enlarging the municipal electric-light plant at a cost of about \$30,000.—A. E. McClellan, Chief Engineer.

Battle Creek, Minn.—The Village Board has decided to purchase electric-light plant and connect water system.

Newark, N. J.—Council has adopted the recommendations made to the Special Committee in charge of the lighting plant for the new City Hall, for installation of an electric-lighting plant to cost, with switchboard and wiring complete, about \$25,000, with two generators of 100-kilowatts capacity and one of 50-kilowatts capacity.

Salamanca, N. Y.—The proposition to issue \$5,000 bonds for improving the electric-light plant carried.

Sherburne, N. Y.—The citizens have voted \$18,000 bonds for electric-light plant.

Sodus, N. Y.—The Sodas Gas and Electric Company has been granted a franchise in the town of Ontario.

Blanchester, O.—The citizens are contemplating extending the lines of the municipal electric-light plant and installing 40 new street lamps.—A. E. Doughman, Superintendent.

Cleveland, O.—The Trenton Rock and Gas Company has been incorporated with a capital of \$12,000, by A. F. Hartz, Ernst Mueller, and others.

Collinwood, O.—The city is contemplating installing a 350 to 400-kilowatt alternating-current, three-phase generator in the municipal electric-lighting plant, to be in operation by May 30.—C. G. Beckwith, Manager.

Dayton, O.—The Dayton Lighting Company is planning to double the capacity of its plant within the next year.—F. M. Tait, Manager.

Elyria, O.—Specifications for the city lighting contract have been approved by Council, and the Board of Public Service authorized to proceed with advertising for contract; 255 lights will be needed.

Sandusky, O.—The Warren Electric Manufacturing Company has reorganized; extensive improvements will be made.—M. H. Nason, Cleveland, President.

Baker City, Ore.—The Fremont Power Company has increased its capital stock from \$300,000 to \$500,000.

Philadelphia, Pa.—The Philadelphia Electric Company proposes to increase the capacity in the center of the city, by the erection of several auxiliary power plants; the first building, which with equipment will cost \$100,000, will be at 113 Arch street; plans have been prepared by John T. Quindrum.

Chattanooga, Tenn.—The Chattanooga Gas Company has decided to issue \$55,000 bonds to be used to pay for plant and improvements.

Pulaski, Va.—Council has offered for sale \$50,000 5 per cent., 25-year electric power bonds.—John T. Loving, Mayor.

Seattle, Wash.—The estimate for the installation of the cluster lights on Third avenue, Third avenue south, Prefontaine place and Fourth avenue south, as prepared by R. H. Thomson, City Engineer, is \$104,100.

The decision of the Supreme Court affirming the validity of the \$600,000 light extension bonds sold to the State, will enable the city lighting department immediately to extend its service to accommodate all Seattle citizens who desire light; as soon as the money from the sale of the bonds is received, the capacity of the power plant will be doubled, and a double-transmission line installed.

Rowlesburg, W. Va.—Bids for constructing the proposed electric-light plant, for which \$12,000 bonds were recently issued, will not be received until about July.—H. R. Hollis, Town Recorder.

Milwaukee, Wis.—The Board of Public Works and Council Advisory Committee have decided to receive competitive bids for both gas and steam machinery for the proposed municipal lighting plant; the cost of a 4,500-horsepower plant with three 1,200 kilowatt direct-connected engine units is estimated at \$380,000.—H. S. Bowen, Engineer.

Wetaskiwin, Alta., Can.—At a recent election the citizens voted to spend \$30,000 in improving the electric-lighting plant.—Address Duncan McEarchan.

FIRE EQUIPMENT

Pine Bluff, Ark.—The Pine Bluff Fire Department is to be reorganized; \$8,000 will be expended in building fire houses.

Coram, Cal.—A fire company is being organized; it is proposed to purchase fire hose.

Laurel, Ia.—Council is arranging to establish fire protection.

Harrisville, Mich.—A disastrous fire occurred at this place; the town is without fire protection, which will be provided.

Vicksburg, Miss.—The Fire Committee recommends the purchase of a chemical engine; bids will be called for soon.

Maplewood, Mo.—A volunteer fire company has been organized.—F. A. Hoffman, Chief.

Fessenden, N. D.—A volunteer fire company will be organized in the near future.

Troy, N. Y.—Plans are being prepared by Demers & Campaigne for a two-story brick house for the Beman Park Hose Company; it will be furnished with shower baths and all the latest improvements, being patterned after a modern engine house in New York City.—James H. Liney, Captain; Edward F. McCann, Supervisor.

Sheldon, N. D.—A Fire Department is being organized.

Corsica, S. D.—A fire company is being organized.

McMechen, W. Va.—Council has under consideration the purchase of a chemical engine.

Milwaukee, Wis.—Council has decided to build a standpipe at the City Hall, to run from basement to roof for fire protection.

Montreal, Que., Can.—Council has appointed a committee to secure improved fire alarm system.

PUBLIC BUILDINGS

Birmingham, Ala.—The county has authorized an issue of \$600,000 in bonds for the erection of a Court House.—Judge S. H. Miller, Attorney for County Board.

New Decatur, Ala.—Bids will be received, April 10, for the purchase of \$25,000 5 per cent., 20-year school bonds.—Samuel Blackwell, Clerk.

Americus, Ga.—Bonds, \$25,000, have been voted for public school building.—E. A. Hawkins, Mayor; Chas. W. Murray, City Engineer.

Sand Point, Idaho.—Bonds, \$10,000, have been issued for school purposes.

Evansville, Ind.—The Board of Education has decided to issue \$132,000 school bonds; bids will be received, April 24.

Terre Haute, Ind.—Architect Robt. Vrydagh is preparing plans for new City Hall.

Burlington, Ia.—Bonds, \$150,000, have been voted to build a new high school.

Belleville, Kan.—The proposition to issue \$10,000 bonds for the erection of a school house will be submitted to a vote of the people.

Louisville, Ky.—Recommendation has been made to the School Board by its Committee on Buildings for three additional school buildings, to cost about \$120,000.

Hillsdale, Mich.—The matter of issuing \$10,000 bonds for City Hall will be submitted to a vote of the people.

Plymouth, Mich.—The citizens have voted \$14,000 bonds for school purposes.

Edina, Mo.—The citizens have voted \$18,000 bonds for the erection of school house.

Joplin, Mo.—The citizens have voted \$150,000 school bonds.

Vineand, N. J.—Plans have been completed for a central heating plant to be constructed at the Soldiers' and Sailors' Home.—G. E. Poole, Trenton, State Architect.

Rochester, N. Y.—The Secretary of the Board of Education has been authorized to

advertise for bids for kalsomining and painting the interior of Schools Nos. 4, 18, 24 and 35.

The Dalles, Ore.—An election will be held in June to decide the question of issuing \$30,000 bonds for City Hall and fire station.

El Paso, Tex.—An election will be held to decide the question of issuing \$100,000 bonds for school purposes.

Houston, Tex.—An election will be held to decide the question of issuing \$500,000 Harris county Court House bonds.

Lewiston, Utah.—The citizens have voted \$30,000 bonds for the erection of a school house.

Walla Walla, Wash.—Bids will be received April 11 for the purchase of \$100,000 City Hall and fire station bonds.

STREET RAILWAYS

Selma, Ala.—F. M. Abbott, president of the Selma Street and Suburban Railroad Company, has purchased a tract of land on Okmulgee creek on which to build an electric light plant, to be operated by water power obtained by the development of Okmulgee creek.

Middletown, Conn.—D. D. Butler, President of the Board of Trade, is promoting the plan of organizing the Hartford-Middletown Trolley Company for the purpose of building an electric line.

Macon, Ga.—The Macon Railway and Light Company will extend the East Macon line from Tattal Square to the three-mile post on Columbus road.

Gridley, Ill.—Council is arranging to establish an electric light system.

Laporte, Ind.—The Murdock syndicate, which recently bought the properties of the Northern Indiana Railroad, connecting Elkhart, Goshen, South Bend, Laporte and Michigan City, will build a traction road from Laporte to Logansport, a distance of sixty miles, and will thus connect with Chicago and Indianapolis.

Sullivan, Ind.—The Evanston and Princeton electric line is to be extended to Sullivan.

Wabash, Ind.—The Indiana Central Traction Company is preparing to extend its line north.—B. J. Draper, President.

Davenport, Ia.—The Davenport and Burlington Interurban Company has been incorporated with a capital stock of \$250,000. C. G. Hipwell, president; Thomas Dougherty, secretary-treasurer.

Girard, Kan.—A local company has been organized to build an electric railway to Mulberry through the coal belt. James McFarland, president.

Junction City, Kan.—The Junction City Electric Railway will extend its line to Ft. Riley; estimated cost about \$30,000. The electric line will later be extended from Junction City.

Louisville, Ky.—The George G. Fetter Lighting and Heating Company, incorporated with a capital stock of \$100,000. George G. Fetter, Howard Wedekemper and others, incorporators.

Owensboro, Ky.—The Owensboro and Rockport Terminal and Bridge Company has been organized at this place, with a capital stock of \$100,000, to build a line to Rockport, Ind., connecting with the Southern Railway, giving Rockport a northern outlet. A bridge will be constructed across the Ohio river at Owensboro. A. S. Kennedy, Rockport, president; James H. Parrish, treasurer.

Kansas City, Mo.—The Metropolitan Street Railway Company has decided to extend the Prospect avenue car line to the Swope Park car line, a distance of two miles.

Canandaigua, N. Y.—The Canandaigua Southern Railway has petitioned for franchise to build an electric road.—George W. Steitzer, Promoter.

Asheville, N. C.—An electric railway line from Baltimore to Montreal, which has been contemplated for some time, now seems to have taken decided shape, and a corps of surveyors are at present engaged in making a preliminary survey of the route; the proposed line will connect at Biltmore with the Asheville trolley system.—Address J. E. Rankin.

Grand Forks, N. D.—Webster Merrifield, President of the North Dakota University, is promoting the building of an electric road from Grand Forks to Crookston.

Laurens, S. C.—Council has granted Mr. N. B. Dial a franchise to build an electric railway in and about the city of Laurens.

Terrell, Tex.—Walter L. Eckhouse, Chief Engineer of the American Engineering Company, with headquarters at Indianapolis, is in the city with a party of eleven surveyors, making a survey of the route for the proposed interurban from Dallas to Greenville.

Grand Rapids, Wis.—The Wisconsin Valley Electric Railway Company, with a capital stock of \$25,000, has been incorporated to operate an interurban line from Grand Rapids to Stevens Point; the company also contemplates extending the system to Wausau and Merrill.—George A. Whiting, Incorporator.

Melrose, Wis.—C. S. Cromwell, of Milwaukee, is organizing an electric company to build road from Melrose to Sparta.

BRIDGES

Quincy, Cal.—The County Board has decided to build an \$8,000 bridge across Feather river.

Bridgeport, Conn.—The Legislature has authorized an issue of \$350,000 bridge bonds.

Wheaton, Ill.—The Aurora, Elgin and Chicago Railway is making preparations to erect a steel bridge across the Northwestern Railroad and Railroad street.

Waterloo, Ia.—The County Commissioners will advertise for the following bridges: Cedar Creek, east of St. Johns; Millers bridge, southeast of New Era; Goodrich in Fairfield, and Lockwood in line of Butler and Jackson townships.

Lansing, Mich.—Council has directed the City Engineer to prepare plans for the erection of a steel bridge over Cedar river.

Virginia, Minn.—Bids will be asked soon by the City Clerk for constructing steel bridge across the narrows between Virginia and Silver Lakes.

Dillon, Mont.—The Buena Vista street bridge has been condemned; a new structure will be built.

Cincinnati, O.—Bonds, \$25,000, have been authorized for rebuilding the H street viaduct.

Findlay, O.—The County Commissioners have decided to build two bridges across the Blanahard river.

Norwood, O.—Bonds, \$35,000, have been voted to rebuild viaduct.

Toledo, O.—An ordinance is before Council providing for issue of bonds for the construction of Cherry street bridge.

Hamburg, Pa.—The Town Council has about completed arrangements with the County Commissioners for a bridge over Mill creek, on State street, to be erected by the county.

Sharon, Pa.—The County Commissioners have decided to build a bridge across the Shenango river at Boyce street.

Knoxville, Tenn.—Bids will soon be asked by the Board of Public Works for repairing bridges; estimated cost, \$20,000.—W. C. Crozer, City Engineer.

Knoxville, Tenn.—The citizens of the Ninth and Tenth Wards are anxious for the old steel bridge at Asylum avenue, which is dangerous, to be removed and a concrete structure erected in its place.

Rosenburg, Tex.—The matter of issuing bonds for erecting bridge is under consideration.

Ogden, Utah.—The Webster and Davis County Commissioners have decided to build a bridge at Unltah, Ogden.

Seattle, Wash.—Plans and specifications for Twelfth avenue bridge have been presented to Board of Public Works; the bridge will extend from Lane to Charles street, and will be 135 feet high where it crosses Twelfth avenue; estimated cost, \$78,000.

Chippewa Falls, Wis.—The County Board is considering erection of bridge across Chippewa river; estimated cost, \$35,000.

MISCELLANEOUS

Trinidad, Col.—Council has authorized the purchase of a 10-ton steam roller from the Port Huron Engine and Thresher Company, Port Huron, Mich., delivered, for \$2,475.—City Engineer Dousman.

New Haven, Conn.—A company may be incorporated for disposing of garbage from New Haven, Bridgeport, Waterbury and Naugatuck.

Americus, Ga.—The citizens have voted to ratify contract made by the City Council with W. A. Dodson and associates to furnish electric arc street lights, pump water for city, and put in electric street car line; the contract necessitates the construction of a power house, modern machinery, electric driven, pumps and car line.—E. A. Hawkins, Mayor; Chas. N. Murray, City Engineer and Superintendent of Waterworks.

Henderson, Ky.—Council has passed an ordinance providing for the sprinkling of streets.

Bay City, Mich.—An election will be held to decide the question of issuing \$200,000 park bonds.

Haddonfield, N. J.—The citizens have voted \$100,000 improvement bonds.

Albany, N. Y.—Through the intercession of the Albany Mothers' Club, Mrs. John D. Whish, President, Council has directed the Board of Public Works to arrange a playground in Dudley Park for the children of the North End.

Georgetown, O.—Council of the village of Mowrytown will employ an engineer to establish a grade for pavements and drainage; it is also proposed to establish a Fire Department.

Springfield, O.—The Board of Public Service will purchase another street flusher.—Address S. J. Lafferty, Director.

Chattanooga, Tenn.—The city, March 12, voted \$1,000,000 bond issue for streets, sewers, city parks, floating indebtedness, fire

and police and City Hall; the City Hall will cost \$200,000, and will be erected on Eleventh street.

Knoxville, Tenn.—Council has petitioned the Legislature to permit the issue of \$165,000 bonds to pay off the city's floating debt, improve the Fire Department, widen one street, and improve a viaduct.

Tyler, Tex.—The disposal of garbage will soon be given the serious consideration of the city government.—John H. Bonner, Mayor.

Clifton Forge, Va.—Council has unanimously voted \$75,000 bond issue, money to be used in street improvements, new 8-room addition to school building, purchase of steam roller and other public improvements.

BIDS RECEIVED

Oakland, Cal.—Michael Murphy has been awarded contract for constructing an ironstone pipe sewer along Cemetery street, at \$6,208, as follows: 2,853 feet 10 to 18-inch pipe sewer at \$2 per foot, 7 manholes \$60 each, 4 lamp poles \$10 each, 42 Y branches, with 6-inch opening, \$1 each; the Stanley Construction Company has been awarded contract for constructing 2,700 feet 4-foot-6-inch concrete storm sewer in Broadway, Forty-second and Diamond streets, at \$5.18 per foot, 60 feet of wooden box sewer at outlet, \$3.60 per foot, 4 manholes, \$65 each. Cotton Bros. & Co. have been awarded contract for concrete storm sewer from Fourth and Newton avenues to Lake Merritt, at \$14,892.35, as follows: 170 feet of sewer 4 feet by 3 feet 4 inches, on timber foundation, at \$21.40 per foot; 105 feet same, with 8-inch top, \$7.75 per foot, and 595 feet with 6-inch top, \$7.19 per foot; 1,008 feet concrete sewer, 3 feet 9 inches in diameter, at \$4 per foot; 200 cubic yards rock filling, \$3.75 per yard; concrete storm water inlets, \$85 each; inlets with cast-iron tops, \$75 each; manholes, \$50; large manhole, \$125; 12-inch pipe conduit, 62½ cents per foot; 24-inch pipe conduit, \$2.50 per foot; 30-inch concrete sewer conduit, \$3.42 per foot; 36-inch concrete sewer conduit, \$4 per foot.—W. B. Fawcett, Secretary, Department of Public Works.

Pasadena, Cal.—The Harper & Reynolds Co., of Los Angeles, has been awarded contract for hose wagon, chemical engine without turret and chemical engine with turret; all bids received for combination hose and chemical engine were rejected; A. B. Tirrell has been awarded contract to repair Dayton street engine house; bids were received as follows for constructing the Mentor avenue engine house: Dawson & Daniels, \$6,695; D. W. March, \$6,850; Ellsworth & Co., \$7,342; C. E. Billings, \$6,477; H. T. Kemp, \$6,190; the bids were referred to the City Commissioners.

Two bids were received for the construction of sewers on Los Robles avenue, Dakota street, Flower street, India street and Buena Vista street; S. J. Edwards bid \$6,200 and C. E. Chamberlain \$6,503.25; the contract was awarded to S. J. Edwards.

Trinidad, Col.—Council, on March 18, awarded contract for paving Main and Commercial streets, District No. 1, to John Laughlin, Trinidad, for \$30,191.50, as follows: Completing pavement, Trinidad brick, 6-inch concrete, 2-inch sand, including necessary excavating and street railroad work, 11,700 square yards, at \$2.37 per square yard, \$27,729; cement curb, 45 cents per lineal foot, \$1,800; repairing or resetting cement curbs, 30 cents, \$500; bringing the present catch-basins up to subgrade and properly setting the cast-iron tops and grating, furnished by the city, \$3.75 per foot in height, \$172.50; providing Coffeyville No. 1 pavers, instead of Trinidad brick, are used, 65 cents additional per square yard is charged, Coffeyville paving blocks, 70 cents; Pueblo pavers, 66 cents; and Galesburg paving block, 80 cents; material has not yet been selected; other bidders were: Harry Hokosano, at \$35,879, and Pople Brothers, \$38,506.—J. H. L. Dousman, City Engineer.

Aurora, Ill.—J. E. Salfsburg & Co. have been awarded contract for laying 4,083 square yards of brick, 4 inches thick, on 6-inch 1:2.5 foundation and 2 inches sand, at \$1.88 per square yard, excavation included, one-half yard per square yard; also for setting 1,560 lineal feet combined curb and gutter, at 55 cents per square yard.—M. J. Tarble.

Evansville, Ind.—Newman and Vineyard were lowest bidders for building the following local sewers, March 23, and have been awarded contracts: First avenue sewer, \$1.64 for 25-inch pipe, 89 cents for 15-inch pipe, \$30 for inlets, \$25 for manholes, \$3.50 for Y's; Walnut street sewer, \$3.86 per foot, \$35 for inlets, \$30 for manholes, \$2 for Y's.

Indianapolis, Ind.—Bids were received by the Board of Works, as follows: For collection, removal and disposal of ashes and sweepings: Samuel W. Smith and James R. Henry, \$27,800; Marion County Construction Company, \$34,000; Indianapolis Sanitary Company, \$35,000; Monroe, George, \$38,950; years, beginning May 26 next, when the

contract held by the Indianapolis Sanitary Company for the removal and disposal of garbage expires, but the bids are regarded as high.—C. A. Bookwalter, Mayor.

Louisville, Ky.—J. N. Connor has been awarded contract to construct the City Hall annex, at \$141,307.12; the foundation has already been built; other bidders for erecting the annex were: J. Bornstein, \$146,785; Rommel Brothers, \$154,998; J. N. Struck & Bro., \$157,000; Lortz & Frey, \$158,863.—Paul C. Barth, Mayor.

Detroit, Mich.—Julius Porath was low bidder for paving Warren avenue with cedar on concrete and Medina curb, including inspection, etc., at \$2.28 per square yard, total, \$30,229.31; Ferdinand Porath & Son were low for paving with cedar blocks on concrete and Amherst curbstone, at \$2.21 per square yard, including inspection, etc., total, \$32,844.34; also for same material, Military avenue, at \$2.10 per square yard, total, \$7,235.54, and for paving Third avenue with brick on concrete and Medina curbstone, at \$2.68 per square yard, total, \$6,700.30; Julius Porath was low bidder for paving Fort street with brick on concrete and Medina curbstone, at \$2.46 per square yard, total, \$24,937.90, and Lennane Brothers were low for paving Leavitt avenue with brick on concrete and Medina curbstone, at \$2.65 per square yard, total, \$5,541.51. The Committee on Streets is considering recommendation that contracts be entered into with the bidders named; other bidders on the work were: Thomas E. Currie, Michigan Contracting Co., W. W. Hatch & Sons Company, James Hanley and R. D. Baker & Co.—J. J. Haarer, Commissioner of Public Works.

Kalamazoo, Mich.—Roy Williams has been awarded contract to construct Metropolitan block pavements on concrete base on East and Washington avenues and Burdick street, for \$1.94 per square yard; Rudolph S. Blane Company, Chicago, Ill., has been awarded contract to lay granitoid block on North Rose street and probably Eleanor street, as an experiment, Alderman Gilbert and City Engineer Taft having reported to Council that the material is giving satisfaction in Chicago.

Newark, N. J.—Contracts for paving three county thoroughfares have been awarded, as follows: Harrison avenue, Essex Fells, from Eagle Rock road to Swamp road, W. B. Matthews, for excavating, 40 cents a cubic yard; for paving, 60 cents a square yard; High street, Nutley and Bloomfield, from East Passaic avenue to Franklin avenue, Osborne and Marcellus Co., for excavating, 50 cents a cubic yard; for paving, 65 cents a square yard; Watchung avenue, Bloomfield, from East Passaic avenue to Broad street, Donata Fusco, for excavating, 43 cents a cubic yard; for paving, 77 cents a square yard.

Buffalo, N. Y.—F. V. E. Bardol has been awarded contract to eliminate grade crossings at Peebs and Nott streets, which involves the expenditure of \$100,000; one-quarter will be paid by the city, one-quarter by the State, and one-half by the railroad company.—Francis G. Ward, Commissioner of Public Works.

Brooklyn, N. Y.—Following bids were received March 25 for installing fire alarm telegraph system in a number of public schools: Commercial Construction Co., New York, \$10,867; Griffin & Co., \$11,957; Fred'k Pearce Co., New York, \$12,688; Gore, Duncan Engineering Co., 206 Broadway, New York, \$12,325.

Medina, N. Y.—Martin J. Scanlon has been awarded contract to lay 24-inch pipe in 6 inches of cement along the bottom of the canal on the East Side, from Church to West street, for \$9,850.

Poughkeepsie, N. Y.—W. B. Horton has been awarded contract for cleaning silt basins at \$1.85 each; the Clinton Point Stone Co., for furnishing crushed stone, at \$1.20 per cubic yard, and Henry Clinton, contract for furnishing slag at 90 cents a load.

Rochester, N. Y.—F. H. Rapp & Company, March 22, were awarded contract to erect new No. 9 school, at \$95,589; the lowest bid received at the proposed letting, March 8, was \$102,000; other bids for all the work or part of it follow: Building complete, A. W. Hope-man, \$98,985; building complete, R. T. Ford, \$110,000; masonry, carpentry and painting, Frank J. Sauer, \$80,836; masonry, P. G. Hauck, \$49,124; masonry, Gorsline & Swan, \$50,497; plumbing, heating and ventilating, R. T. Ford, \$18,645; heating and ventilating, C. F. Fisher, \$14,181.93; steam heating, Howe & Bassett, \$14,295; plumbing, C. F. Rodenbeck, \$4,876.30; painting, A. R. Banning, \$2,060; painting, Walker & Jarret, \$2,150; painting, S. I. Etrel, \$2,260. Contracts for building and completing four rooms and an assembly hall at No. 36 school were authorized as follows: Mason work, G. G. Kirchner, at \$10,800; carpenter work and painting, Homer Knapp, \$10,865.46; plumbing, heating and ventilating, R. T. Ford Company, \$5,230. The contract for building new toilet rooms at No. 24 school was awarded to S. & J. W. Beisheim, the lowest bidders, at \$3,251.

Schenectady, N. Y.—J. J. Molloy has been awarded the contracts for the grading of Main street and Helderberg avenue; on the first the bid was cut 25 cents a cubic yard; fill 2 cents; and on the other cut 2 cents and fill 3 1/2 cents; Beckwith Brothers were the only other bidder; their price was cut 24 cents and fill 20 cents, and cut 18 cents and fill 38 cents; the bid of the Union Paving Company for the paving of a portion of Villa road was turned down and the City Clerk authorized to readvertise.

Schenectady, N. Y.—Joseph Clements & Son have been awarded contract to lay 45,-938 feet of cast-iron water mains in 30 streets, at 32 cents a foot for 8-inch pipe, 30 cents a foot for 6-inch pipe, 28 cents a foot for 4-inch pipe and \$2.40 a cubic yard for excavation, and a scale of prices for pipes in various streets, and Beckwith Bros. bid 41 cents a foot for pipe and \$2.50 a cubic yard for excavation; action was deferred on the bids for sewers along lands of the New York Central and Cotton Factory Hollow.

Troy, N. Y.—H. S. Packard has been awarded contract to furnish brooms for the Department of Public Works, at \$3 per dozen. Mayor Mann.

Cincinnati, O.—The Board of Public Service awarded a contract for 20 street flushing machines to the St. Louis Street Flushing Machine Company.

Cleveland, O.—The following were low bidders for constructing delinquent sidewalks during the year, bids for which were opened March 14: Stone sidewalks, Eastern District, comprising eastern half of city, 20,000 square feet 2 1/2-inch sawed stone flagging, laid in single width on clay with ballast, 1 1/4 cents per foot; 65,000 square feet, 2 1/2-inch sawed stone flagging, laid in single width walls, without ballast, 1 1/4 cents per foot; 15,000 square feet, stone flagging, taken up, rejointed and relaid to grade, 1 1/4 cents; for the same items, same quantities, in the Western District, the Elyria Stone Co. bid 1 1/4 cents, 11 cents, and 1 1/2 cents; cement sidewalks, Eastern District: 25,000 square feet, cement sidewalk furnished and laid, 9 cents; 5,000 feet, laid on clay with extra foundation, 9 1/2 cents; 6,000 square feet old stone flagging taken up, rejointed and relaid to grade, 2 cents; for the same items, same quantities, Western District, the Elyria Stone Co. bid 9 1/2 cents, 10 cents, and 3 cents.

The W. M. Pattison Supply Co. was low bidder for stopcock boxes, bids for which were opened March 11, offering 6,000 stop boxes complete at \$1.79 1/2 each; tops, 88 cents each; bottoms, 92 cents each; plugs, 4 cents each. The Rensselaer Mfg. Co., Troy, N. Y., was low for gate valves as follows: 3-inch, \$6.83; 4-inch, \$7.65; 6-inch, \$12.60; 8-inch, \$18.90; 10-inch, \$26.25; 12-inch, \$34.50; 16-inch, \$66.50; 20-inch, \$134.25; 24-inch, 217.50; 16-inch, extra heavy valve, 136.60; 20-inch, extra heavy, \$216.60; total, \$7,826.95.

The Standard Oil Co., of Ohio, was low bidder for furnishing 30,000 gallons of 70-72 gasoline for vapor street lighting, for three months, at 15 cents per gallon.

The St. Louis Street Flushing Machine Co. was low bidder for furnishing four automatic street flushing machines, bids for which were opened March 21, at \$800 each for machines with 850-gallon tanks, or \$3,000 providing contract is awarded company for all machines.—A. R. Callow, Secretary, Board of Public Service.

Elyria, O.—Hunker and Williams have been awarded the contract for the Taylor street storm water sewer on the East Side.

Ironton, O.—The contract for five well clusters and laying 4,600 feet of 20-inch cast-iron pipe in the Ohio river, has been awarded the Harrison Construction Company of Newark, N. J.; 5-well clusters, \$13,750; laying pipe, \$16,100; total, \$29,850.—Geo. H. Davies, Clerk, Board of Public Service.

Milford Centre, O.—Wm. McHugh of Springfield is the low bidder for the improvement of several streets with Townsend block on a gravel bed with cement filler.

Erie, Pa.—Patrick Doyle has been awarded contract to construct 9-inch tile sewer in Twenty-third street! Dennis O'Brien, Joseph McCormick & Sons and David Jones also submitted proposals.—Michael Liebel, Jr., Mayor.

Reading, Pa.—Councils have ratified the award of the Board of Public Works to John A. Raven, for paving the following streets with McAvoy shale block: Chestnut, Second to Third, at \$3,626.87; Sixth, Laurel to Willow, at \$3,626.87; Court, Fourth to Fifth, at \$2,895.74; Court, Ninth to Eleventh, at \$3,507.24; Walnut, Sixth to Seventh, at \$3,846.87; Hawman Bros., Fehr & O'Rourke, David Ault, L. H. Foelt & Son and John Falbrecht.

Salt Lake City, Utah.—Bids were opened by the Board of Public Works, on March 16, as follows: Constructing Cement Sidewalks for the Year 1907: S. Birch, Salt Lake City, \$92,453; R. S. Bloom Company, Chicago, \$101,085; contract awarded to S. Birch. Constructing Cement Sidewalk Extension No. 108: Johnson and Beacom, Missoula, Mont.,

\$262,036; S. Birch, Salt Lake City, \$277,646; R. S. Bloom Company, Chicago, \$299,008. Repairing Paved Streets: P. J. Morgan, Salt Lake City, \$11,155; contract awarded. Construction of Stone Block Cross-Walks: Custer and Burt, Salt Lake City, \$3,640; Palm and Nelson, Salt Lake City, \$4,040; contract awarded to Custer and Burt.

Construction of Water Mains for the Year 1907: J. W. Percival, Salt Lake City, \$119,592.50; P. J. Moran, Salt Lake City, \$129,142.70; Hanley and Ritchie, Salt Lake City, \$132,814.50; Midgley Bros., Salt Lake City, \$133,372; James Kennedy, \$138,295.

Construction of Pipe Sewers for the Year 1907: James Kennedy, Salt Lake City, \$282,728; Hanley and Ritchie, Salt Lake City, \$296,901; P. J. Moran, Salt Lake City, \$300,233; contract awarded to James Kennedy.

Constructing New Water Supply Mains (Cast-Iron pipe): P. J. Moran, Salt Lake City, \$231,343.04; Hanley and Ritchie, Salt Lake City, \$241,544.80; Midgley Bros., Salt Lake City, \$243,957.64. Continuous Wooden Stave Pipe: P. J. Moran, Salt Lake City, \$145,991.24; Hanley and Ritchie, Salt Lake City, \$164,767.60; Midgley Bros., Salt Lake City, \$165,634.64.

The contract for constructing cement sidewalk extension No. 108 and the construction of water mains for the year 1907 have not yet been approved by the City Council.—L. O. Kelsey, City Engineer.

Norfolk, Va.—The Board of Control has awarded the contract for constructing crematory to the De Carle Manufacturing Company, of Toledo, O., at \$29,600; it will be ready for service in two months.

Petersburg, Va.—The Special Committee on Public Improvement has awarded the contract for laying 31,000 yards of granolithic pavement to W. T. Rahily; 16,000 yards of this unfinished work was to have been done by the Southern Contracting Company, which recently became financially embarrassed; the other 15,000 yards is new work which is to be done in different parts of the city; the bidders for the work and their bids were as follows: Perkinson and Finn, \$1.27 per yard; I. J. Smith, Richmond, \$1.30 per yard; F. M. Bradley, Richmond, \$1.35 per yard; W. B. Ritchie, \$1.19 1/2 per yard for the unfinished work, and \$1.28 per yard for the new work; W. J. Rahily, \$1.21 per yard.

Charleston, W. Va.—Sixth avenue is to be paved from Eighth to Sixteenth street, the contract having been awarded to Harrison and Bean, at \$38,000; the paving will be on gravel foundation instead of concrete, and work will commence May 1.

THE almost World-wide tendency among the municipalities to go over to the wood-block in preference to the other pavements has been brought about by its record on the London and Paris foundations. We can sell you this foundation at one-half the London and Paris prices. Over twenty-five years ago the creosote wood paving-block fell into utter disrepute in America, on account of the American foundation. The Nash Road, Borough of Brooklyn, New York City, U. S. A.

LET US OPEN the door of success for you by putting you in line for advancement. Hundreds of high-grade positions now open at \$1,000-\$5,000; write us to-day. Hapgoods, 305 Broadway, New York.

STREET LAMP ATTACHMENT

The present flat flame gas light quickly changed to
BEST MODERN LIGHTS.

Lamps giving 10-25 candlepower made to produce 40 to 70 candlepower. No additional gas consumed

CENTURY LIGHT & POWER CO.
35 Warren St., N. Y. City

Proposals

Viaduct

New Orleans, February 21, 1907.

Pursuant to Ordinance No. 4301, N. C. S., sealed proposals will be received at the office of the Comptroller in the City of New Orleans until the hour of 1 p. m., Monday, April 29, 1907, for the construction of a viaduct over the tracks of the Southern Pacific R. R. Co., on the line of Newton street in Algiers, in accordance with the plans and specifications on file in the office of the City Engineer.

Deposit \$1,000.00 with the City Treasurer and his receipt enclosed with bid.

Bond in an amount equal to the contract price.

The City Engineer will furnish bidders with a blank form of proposal. No proposal will be considered unless submitted on such form.

Bidders must have paid their City license in order that their bids may be accepted. The city reserves the right to reject any and all bids.

CHAS. R. KENNEDY, Comptroller.

MUNICIPAL CIVIL SERVICE COMMISSION

299 Broadway.

New York, March 11, 1907.

Public Notice is Hereby Given that applications will be received from Monday, March 11, until 4 P.M. Wednesday, April 24, 1907, for the position of

ASSISTANT ENGINEER IN CHARGE OF SECTION, BOARD OF WATER SUPPLY.

The examination will be held on Wednesday, May 3, 1907, at 10 A.M.

Appointments will be made for work outside of the city, and certification will be made to the Board of Water Supply only.

The examination is open to all citizens of the United States.

The salary is \$2,400 per annum and over.

Ten years' experience is necessary.

Graduation from a technical school of recognized standing will count as two years' experience. A candidate must show at least two years of experience in charge of work or in a position in which he had some authority or responsibility.

Statements of such examination will be subject to publication, and must be furnished to the Board of Water Supply.

In submitting statement of experience, a candidate must show just what his connection has been with each piece of work, and just what measure of responsibility rested upon him.

The minimum age is 28 years.

For scope of examination and further information, apply to the Secretary.

FRANK A. SPENCER, Secretary.

MUNICIPAL CIVIL SERVICE COMMISSION

299 Broadway.

New York, March 13, 1907.

Public Notice is Hereby Given that applications will be received from Wednesday, March 13, until 4 P.M. Monday, May 13, 1907, for the position of

TOPOGRAPHICAL DRAUGHTSMAN.

The examination will be held on Wednesday, May 29, 1907, at 10 A.M. The examination is open to all citizens of the United States. Vacancies exist in the Board of Water Supply. Certification will be made for appointment at \$1,200 per annum only.

For scope of examination and further information, apply to the Secretary.

FRANK A. SPENCER, Secretary.

USING KENTUCKY ROCK ASPHALT IN PLACE OF SCREENINGS FOR MACADAMIZED ROADS

"THE WADSWORTH" MACADAM

PRODUCING A DUSTLESS, MUDLESS, NOISELESS AND WATER-PROOF ROADWAY. NO HEATING REQUIRED

The Coming Roadway

Write for Descriptive Booklet

The Wadsworth Stone & Paving Co., 405 Bessemer Bldg., Pittsburg, Pa.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Municipal Interest

CAMERON SEPTIC TANK

Cameron Septic Tank Co. vs. Saratoga Springs, Madison, Wis., Lake Forest, Ill., Monmouth, Ill., and the Allis Chalmers Co.—This case has been pending since 1903 and arose out of the claim that, in the construction of the septic tanks connected with the sewer systems of the defendants, the company's patents had been infringed. The case originally was brought against Saratoga and by mutual agreement the other defendants joined in the suit. In a lengthy decision, Judge Ray lays down the principle that "a process of nature cannot be patented." The case will be appealed to the Supreme Court.—United States District Court, Northern District of New York.

POWER OF VILLAGE PRESIDENT

President McCain vs. Village Board.—The court ruled that the President of the Village Board of Coal City, Andrew McCain, has power equal to that of the Mayor of a city, in that he may appoint the officers who will have to be confirmed later by a majority vote of the Board of Trustees. The members of the board contended that the President's power in the matter was only equal to that of any member of the board.—Appellate Court, Ottawa, Ill.

SUNDAY CLOSING LAW

People vs. Edward F. Dunne, Mayor.—The argument of the defense was that the State statute regarding the Sunday closing law has no application within the limits of Chicago, as it was repealed by the enactment of the charter, the Cities and Villages Act and other special acts. The court holds that as there is no express provision for the repeal of the Sunday closing law it is in full force and effect in Chicago, as well as elsewhere in the State. Regarding the petition for a mandamus to compel the Mayor to exercise his police power to close the saloons, the court holds that a court of chancery is not authorized to issue a writ of mandamus against the executive of a city to compel the exercise of a general duty coming within the general exercise of the police power.—Superior Court, Cook county, Ill.

INTEREST ON CITY FUNDS

New Orleans vs. Board of Liquidation.—The object of the suit was to compel the board to place the proceeds of the 1 per cent. debt tax on deposit with such bank or banks as would allow interest and to annul the selection of the New Orleans National Bank as the board's fiscal agent. The court held that the board was vested with the absolute right of selecting its own depository and that the discretion of the board could not and would not be interfered with by the court. In the course of the opinion the court said the board might, if it saw fit, require its depository to pay interest on deposits, but that the board would not be compelled to do so.—Louisiana Supreme Court.

VALID ELECTION

People vs. P. C. Barth.—In the Louisville contested election case Judges Miller and Kirby handed down a decision refusing to nullify the 1905 election by which P. C. Barth was chosen Mayor. The court holds that fraud was practiced, but that it was not sufficient to invalidate the election.—Kentucky Supreme Court.

TAXING POLES

Pennsylvania Telephone Co. vs. Borough of South Bethlehem.—The company, under the act of 1905, filed a petition against the tax levied upon its poles by the Borough of South Bethlehem. The borough in its answer contended that the law was unconstitutional. The court rules against this view of the law and fixes ten cents as the amount the borough may charge the company for each pole it has erected on the streets and highways. The court's decision is to the effect that the borough cannot charge a tax on poles greater than the amount it costs to inspect them.—County Court, Easton, Pa.

DRAINAGE

Snyder vs. Village of West Hammond.—In this case the Supreme Court of Illinois upheld as not unreasonable an assessment for a pumping station and system of sewers estimated to cost \$127,774, the assessments ranging from \$12.50 to \$54.75 on each lot the drainage district to cover about one-third of the area of the village. The village contains altogether about 4,500 inhabitants, the buildings being scattered and consisting mostly of small cottages, with but one paved street. The land, however, is practically level and in the spring and fall the overflow of surface water costs the village from \$1,600 to \$2,000 a year to open ditches and restore culverts.—Supreme Court of Illinois.

FIRE LOSSES

Hazel vs. City of Owensboro.—It was held that a city was not responsible to the owner of a house therein for its destruction by fire on the ground that the street on which the house was situated was negligently allowed by the city to become so out of repair that the hose wagon and engine of the fire department were mired therein, and were thereby delayed in reaching the house in time to save it from loss. The court said that the negligent condition of the street had nothing to do with the origin of the fire, and it could not reasonably be anticipated by the city that any loss by fire would result from the condition of the street.—Court of Appeals, Owensboro, Ky.

INCORPORATIONS

Acetylene Construction Co., Boston, Mass.; acetylene gas plants; capital, \$125,000. President, Ernest A. Frary, South Deerfield, Mass.; treasurer, Edward N. Frary, South Deerfield, Mass.; clerk, George M. Faulkner, Cambridge, Mass.

Aleco Brick Co., New York; to manufacture composite stone and brick, etc.; capital, \$200,000. Incorporators: E. Howard Foster, Eliot Norton, William J. Blackburn, 100 Broadway, New York, and others.

Ash Grove Lime and Portland Cement Co., Portland, Me.; lime and cement; capital, \$1,750,000. President, J. E. Manter; treasurer, C. E. Eaton; clerk, M. W. Baldwin, all of Portland, Me.

Aspinwall Water Co., Pittsfield, Mass.; waterworks; capital, \$50,000. President, Charles A. Wright; treasurer and clerk, De Witt Bruce, both of Pittsfield, Mass.

Bethesda Heat, Light and Power Co., Bethesda, O. Incorporators: T. Riley Hoffman, T. Stuggers, and others.

Chattanooga Gas Company, Chattanooga, Tenn.; capital, \$1,250,000. J. P. Hoskins, president; Guy W. Rouse, vice-president; Howard A. Thornton, secretary; Ralph S. Child, treasurer. Directors: Frank T. Hulsuit, Richard Schaddelee, Earnest A. Stowe, Claude Hamilton, Claude M. Hurd, of Grand Rapids; George H. Taylor and George B. Caldwell, of Chicago; W. T. Green, W. A. Ladd, Garnet Andrews, of Chattanooga.

Denver Reservoir Irrigation Co., Portland, Me.; waterworks; capital, \$12,000,000. President, J. E. Manter; treasurer, C. E. Eaton; clerk, M. W. Baldwin, all of Portland, Me.

Engineering Construction Co., Scranton, Pa.; to engage in general construction business; capital, \$25,000.

Home Light and Power Company, Andrews, Ind.; capital, \$5,000. Incorporators: C. E. Endicott, E. L. Taylor and others.

National Ozokerite Co., Portland, Me.; mining bitumen; capital, \$300,000. President, J. E. Manter; treasurer, C. E. Eaton; clerk, M. W. Baldwin, all of Portland, Me.

New Jersey Consolidated Water and Light Co., Deal, N. J.; water, light, etc.; capital, \$300,000. Incorporators: James H. Dalton and C. B. Voestoch, 5 Nassau street, New York; Samuel Luciw, Jr., 106 North Fulton avenue, Montclair, N. J.

Potomac Dredging Co., Baltimore; to dredge for sand, gravel, etc., from the Potomac river; capital, \$500,000. Incorporators: Angus Cameron, Enoch Harlan, W. N. P. Jacobs, Baltimore.

Texico Water and Light Co., Texico, N. M.; capital, \$10,000. Incorporators: R. Reagan and Ed. T. Masey.

PATENT CLAIMS

845,830. **Apparatus for Tapping Mains.** Walter H. Van Winkle, Newark, N. J. Serial No. 284,942.

In an apparatus for tapping mains, the combination with the coupling, and parts connected thereto, of a drill-shaft, drill, and an annular saw, a frame for supporting the same, an internal-combustion engine mounted upon the frame, gears between the engine and shaft for rotating the latter, and a connection between the coupling and water-jacket of the engine, to admit water after the saw has been brought into action.

845,910. **Road Construction.** Charles P. Walter, Harrisburg, Pa. Serial No. 342,381.

The herein-described method of manufacturing roadbeds, said method consisting in placing a layer of dry grouting material on the ground, then adding a layer of broken stone, and then pouring a thin watery grout through the layer of broken stone to fill the interstices of the latter, and to hydrate the layer of dry grouting material.

845,969. **Road-Grader.** Alexander W. McBlain, Killduff, Iowa. Serial No. 322,633.

In a road-grader, a frame, a cutter supported beneath the frame and comprising a flat blade arranged substantially horizontally and inclined obliquely relative to a fore-and-aft line through the frame and a scraper fixed to the frame in the rear of the blade.

846,278. **Grader.** John Bagley, Tacoma, Wash. Serial No. 325,481.

A grader having a bucket presenting a plurality of blades having cutting edges, one of said blades having a plurality of teeth mounted thereupon and projecting beyond said edge.

845,744. **Machine for Cleansing Filter-Beds.** Hiram W. Blaisdell, Los Angeles, Cal. Serial No. 179,396.

A machine provided with a movable elevator, scraping means associated therewith, a cleansing device receiving the material raised by the elevator, means for conveying a fluid into and from said cleansing device, a conveyor receiving the cleansed material from said device and returning the same to the place from which the material was originally taken and means for operating the parts.

845,746. **Machine for Cleaning Covered Filters.** Hiram W. Blaisdell, Los Angeles, Cal. Serial No. 233,003.

A machine constructed to operate upon covered filter-beds provided with means for cleaning the material thereof, instrumentalities for supporting the machine beneath the filter-cover and mechanism for progressing and for operating the same.

845,964. **Garbage-Receptacle.** Charles C. Mittendorf, St. Louis, Mo. Serial No. 330,864.

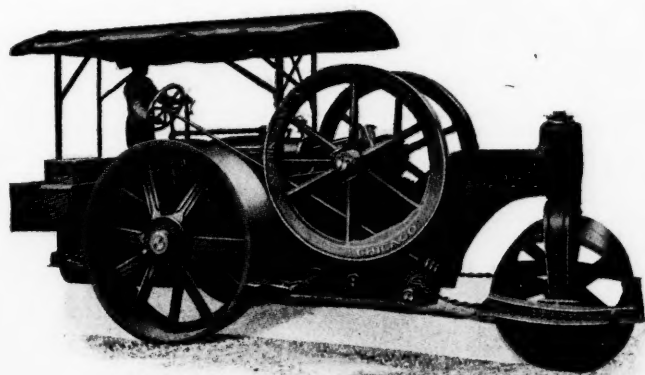
A garbage-receptacle provided with a hinged lid, one end of the receptacle having laterally-projecting flanges adapted to be held against the face of a fence, in an opening in which the receptacle is designed to be held, a hinged door mounted at the flanged end of the receptacle, bracket members fixed to the inner surfaces of the side walls of the receptacle, a tray supported upon said bracket members and having angled ends extending beyond the ends of the bracket members and adapted to bear against the ends of the receptacle, as set forth.

Trade Notes

HOUSE-SEWAGE.—The House-Sewage Disposal Company, 6515 Normal avenue, Chicago, issues a pamphlet describing the Ashley Residential Septic Tank and Nitritication Duct. The apparatus consists of two principal parts, in each of which a different process of decomposition takes place. In the septic tank, where the sewage is first delivered, the usual action of bacteria that flourish when not exposed to air takes place. From this underground tank a pipe near the surface leads to a "nitritication duct," a shallow underground chamber of considerable superficial area, where the liquid sewage is exposed to the action of bacteria which flourish when exposed to the air. The surplus water leaving this duct is absorbed by the ground.

BRIDGES.—The Strauss Bascule and Concrete Bridge Company, 903-904 Fort Dearborn Building, Chicago, Ill., issues a catalogue describing and illustrating several designs which are offered as economical substitutes for swing bridges and fixed steel structures. The Strauss Trunnion Bridge is claimed to be especially safe, because it cannot open accidentally under live load, as the break in the floor is in front of the trunnion instead of behind it. The bearings are well protected from the possibility of foreign substances getting into and injuring them. In all of the designs attention is paid to appearances as well as utility. The company owns a number of fundamental and detail patents for devices used in their bridges.

MOTOR ROAD ROLLER.—The Austin-Western Company, Ltd., Chicago, Ill., has placed on the market the American Motor Road Roller, which is thought to be the first motor road roller ever made in America. The roller is made in 7, 10, 12 and 15-ton sizes. The machine is neat in appearance, and affords the engineer an unusually clear view of his work. Having no boiler, the weight is principally in the frame and wheels. The merits which the manufacturers believe the machine to possess are these: The roller carries a gasoline tank of sufficient capacity to run ten hours on full load. Gasoline is an economical fuel for a roller, because fuel is consumed only when work is performed; because no time has to be wasted getting up steam in the morning; because there is no danger and expense due to damages from smoke soot, steam and sparks. There is no danger of explosions. The item of boiler repairs is eliminated. The expense of providing water is done away with, as the roller has an air-cooled cylinder. The mechanism is simple, start, stop and reverse being accomplished by a single lever. Speed of travel can be varied by a slight movement of the lever. The low center of gravity and the absence of a shifting weight give the roller a steadiness of motion that gives excellent results.



MOTOR ROAD ROLLER

LIMOID.—The Charles Warner Company, Land Title Building, Philadelphia, Pa., issues a booklet describing "Limoid," a scientifically manufactured pure lime powder. The results of the use of this material in increasing the density of cement mortar and in effecting economies when used in certain definite ways is described and verified by a series of tests made in the Henry S. Spackman Engineering Company laboratories at Philadelphia. Tests made, 1 part cement, 3 parts sand, do not show strengthening effect, but do decrease the permeability and water absorption. Tests of 1 to 5 mixtures show that with mixture ranging from 25 to 40 per cent. Limoid the voids have been satisfactorily filled and a mortar of maximum strength secured. Strengths secured by replacing from 25 to 40 per cent. of cement with Limoid carrying the five parts of sand show greater on an average than Rosendale cement tests carrying only three parts of sand. The detailed information contained in the tests is worth serious consideration on the part of the engineer and constructor. The booklet contains a number of handsome illustrations of buildings in which Limoid has been used, notably the United Engineering Society Building, New York City.

LIGHTING SYSTEM.—The Fort Wayne Electric Works, Fort Wayne, Ind., in Bulletin No. 1,090, describe their alternating current arc lighting system, in which arc lights are operated in series. The system comprises the following principal appliances: Constant current regulator, constant potential transformer, high-tension switch-board, constant current, alternating current arc lamps, multiplex lighting arresters. An instruction book, No. 3,024, contains careful instructions for erecting and operating this system.

PERSONALS

BAILEY, J. A., of Arlington, Mass., has been reappointed a member of the Metropolitan Water and Sewerage Board of Massachusetts.

BECKER, SHERBURN M., Mayor of Milwaukee, Wis., recently wrote the Commissioners of the District of Columbia for information regarding the office of Sealer of Weights and Measures, as the western city contemplates creating such an office, and the communication has been answered by Col. W. C. Haskell, Sealer of Weights and Measures, to whom it was referred.

BURNHAM, D. H., of Chicago, Ill., who has been instrumental in the beautifying of Washington, Denver, Cleveland, San Francisco and other cities, has been engaged to perform similar work at Minneapolis, Minn.

CARDWELL, WILLIAM, Mayor of East Orange, N. J., with Joseph M. Brown, Chairman, and Councilmen Lincoln E. Rowley and Joseph Lee, of the Ordinance Committee, recently made a trip to New Bedford, Mass., to inspect the plant recently installed for the reduction of garbage.

CARY, EDWARD R., has been appointed Village Surveyor of Green Island, N. Y.

CHALFANT, JAMES G., has been elected County Engineer of Allegheny County, Pa., to succeed Charles Davis, deceased.

CORSON, S. CAMERON, has been reelected Borough Engineer of Norristown, Pa.

| | | |
|---|---------------------------------------|---|
| TRANSACTS A GENERAL BANKING AND TRUST COMPANY BUSINESS | | |
| ROBERT S. BRADLEY, President | CLARK WILLIAMS, Vice-President | |
| LANGLEY W. WIGGIN, Secretary | HOWARD BAYNE, Treasurer | |
| PARK TERRELL, Mgr. Bond Dept. | DAVID S. MILLS, Trust Officer | |
| CAPITAL AND SURPLUS | COLUMBIA TRUST COMPANY | TWENTY-SIX NASSAU ST. NEW YORK |
| \$2,000,000. | | |
| OFFERS A PRACTICAL METHOD FOR THE ISSUE OF MUNICIPAL BONDS | | |
| AFFORDING ADEQUATE SAFEGUARDS AGAINST FORGERY AND OVER-ISSUE, AND SERVING THE CONVENIENCE OF THE ISSUING OFFICIALS. SEND FOR BOND PAMPHLET No. 6. | | |
| ACTS AS FISCAL AGENT FOR STATES AND MUNICIPALITIES. | | |
| INDEPENDENT OF THE CONTROL OF ANY SINGLE INTEREST. | | |

COVERT, FRANK, of the Ocean Fire Company, of Sea Bright, N. J., has been elected Chief of the Fire Department over John E. Howland, of the Hook and Ladder Company, to succeed Martin L. Minaugh, one of the Councilmen of the Borough, and William R. Fowler, Assistant Chief.

DRENNEN, W. M., former Mayor of Birmingham, Ala., is President of the Bank of Pratt City, recently incorporated.

DRUM, G. F., of Newark, N. J., has been elected Engineer of Essex County.

EDWARDS, WILLIAM H., of the Borough of Brooklyn, has been appointed Deputy Street Cleaning Commissioner of New York City, at a salary of \$5,000 per year.

EVANS, R. R., has been reelected City Engineer of Haverhill, Mass.

FARNAN, THOMAS F., Marshal of Police of Baltimore, Md., was on March 30, when he completed forty years' service as a member of the Police Department of the Monumental City, presented with a silver service by George R. Willis, President of the Board of Police Commissioners, on behalf of the Board and the members of the Department, the ceremony taking place at Hagager's Hall, and being witnessed by hundreds, anxious to do honor to the veteran guardian of the peace.

GILBERT, WILLIAM C., has been elected Mayor of Danbury, Conn., over Mayor William A. Braun, and Henry M. Fanton, City Clerk.

GILKERSON, WILLIAM H., SR., has been elected City Clerk of Laurens, S. C., succeeding L. G. Balle, who served in the office sixteen years; R. Edgar Babb, City Attorney; Jas. H. Boyd, Superintendent of the Water and Light Plants; John H. Henderson, Superintendent of Streets; John Henderson, Electrician; William S. Bagwell, Chief of the Police Department.

HALSEY, EDMUND R., has been appointed Township Engineer of South Orange, N. J.

HANCOCK, F. L., has been elected City Engineer of Quincy, Ill.

HASTINGS, VOLNEY C., for many years Superintendent of the Waterworks Department of Concord, N. H., died recently.

JONES, JOHN A., has been elected City Engineer of Lewiston, Me.

KAY, EDGAR B., Professor in charge of the Engineering Department of the University of Alabama, has been retained to prepare plans and to superintend the construction of a combined electric light and waterworks plant at Citronelle, Ala.

TRENCH MACHINES

We Sell and Lease All Kinds of Hoisting and Conveying Machines for Trench Work

Catalogue Sent Upon Request

Carson Trench Machine Co.

BOSTON, U. S. A.
BRANCH OFFICES: 10 Barclay Street, New York; Park Bldg., Cleveland; 299 St. James Street, Montreal.



LEADITE

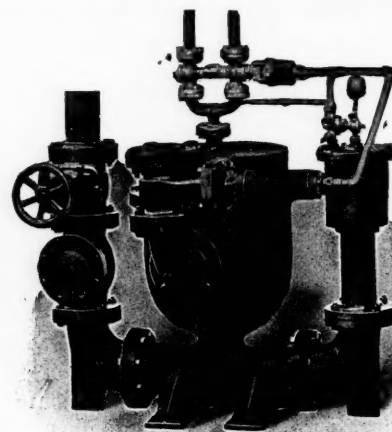
THE BEST PIPE JOINTING MATERIAL FOR WATER AND GAS MAINS ETC.

NO CAULKING REQUIRED. COST LESS THAN ONE-THIRD THE COST OF LEAD. ONE TON WILL DO MORE WORK THAN FIVE TONS OF LEAD. JOINTS WILL NEVER LEAK. IN USE 11-12 YEARS IN PHILADELPHIA, PA. NOW ADOPTED BY WATER DEPARTMENT. IN USE IN MANY CITIES.

WRITE FOR PAMPHLET, PRICES, ETC.

THE LEADITE COMPANY OF AMERICA
642 HEDD BUILDING, PHILADELPHIA

ELLIS Automatic Ejectors



Specially Designed for the Ejection of Sewage, Water, Chemicals, Semi-Solids of Every Description.
Send for Catalogue.

THE ELLIS COMPANY
216 West 23d Street - New York

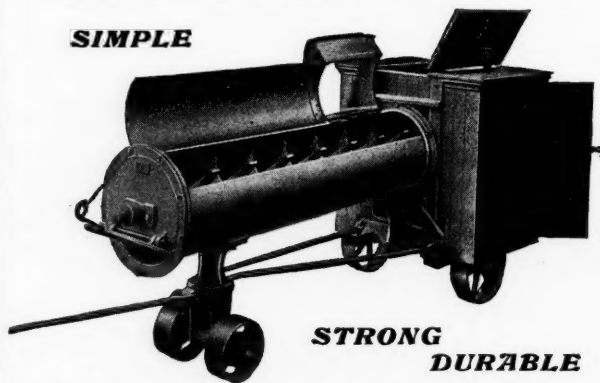
THE GRANT

The Only MORTAR MIXER on Earth

Guaranteed to keep 100 brick or stone masons busy. Makes the richest of mortar and tempered to the right consistency with 20 per cent. less lime.

No better cement and concrete mixer of its capacity is on the market. Ask for Booklet E and Prices.

SIMPLE



STRONG DURABLE

U. S. Concrete Machine Co., Detroit, Mich., U. S. A



Awarded Gold Medal St. Louis Exposition 1904

TRADE MARK

EUREKA FIRE HOSE

is the highest possible grade of SEAMLESS COTTON Rubber Lined Fire Hose that can be manufactured.

All Sizes for Every Possible Duty.

"Eureka" (Four Ply) "Paragon" (Three Ply) "Red Cross" (Two Ply)

Send for Price List and Samples.

EUREKA FIRE HOSE CO., 13 Barclay Street, New York
BOSTON PHILADELPHIA CHICAGO